



Voltage tester

High voltage tester

Ex-testing devices

Quality creates safety

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Quality creates safety

Quality is a precondition for safe products



As a family enterprise, we set extraordinary standards in the quality and safety of our measuring and testing equipment. With our high-quality products, we provide our customers maximum safety within electrical systems. Tradition and innovation, complete manufacturing and quality control in Germany, as well as customer-specific solutions in various application areas are the strengths and the guarantee of the quality promise of Tietzsch.

Already in **1953**, we were able to manufacture the particularly robust and safe „Prüfball“ with its innovative dust-proof rubber housing.

Today, we develop and produce voltage testers, high voltage testers and explosion-proof devices under highest quality and safety requirements and offer customised solutions tailor-made applications. Easy operation and reliable displays underline the functionality of our devices and correspond with today's customer requirements.

Tradition and innovation



Certified safety and quality



Our measuring and testing equipment is subject to constant quality control. Regular production monitoring is carried out by VDE, UL and DEKRA.

- **VDE** certificates for voltage testers and their annual production control
- **UL / CSA** certificate for the USA-Canada version of the MultiSafe
- **DEKRA-EXAM** and **TÜV** certificates for explosion-proof measuring instruments and the annual QM auditing of the production facility

Manufacturing „Made in Germany“

All our products are „Made in Germany“.

Based on complete in-house manufacturing process, we ensure the highest level of quality and provide you with special tailor-made solutions.

This includes the careful selection of high-quality materials and the complete testing of each individual device.



Company headquarters and production in Ennepetal



Mechanical processing for accessories according to customer requirements



Ensuring quality through our own electronics production



Assembly of highly complex measuring systems



Tests up to 70 kV in our high voltage laboratory



100% inspection of each device

Technical support / service



In addition to our high-quality products, we offer comprehensive and professional customer service and technical support.

Our contact persons and specialists will be gladly available for your questions concerning our products and services.

Technical hotline +49 2333 861 77 03

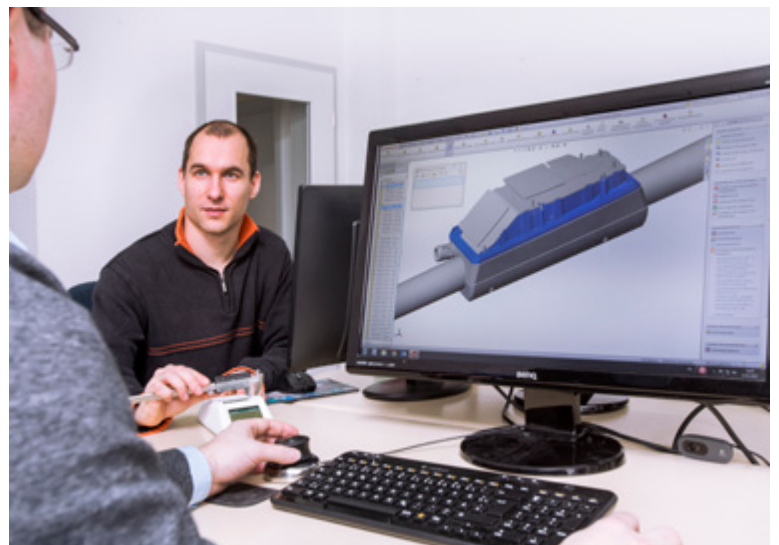
We will find your solution

Are you looking for measuring and testing equipment for special applications?

Our service:

We would be pleased to advise you on specific problems and find tailor-made solutions. With our team of specialists and many years of experience, we demonstrate our strength and flexibility, even in small series.

We look forward to new challenges.



On site for you



Specific application place special demands on the measuring and testing equipment.

We would be glad to come to you to support you in special applications and develop joint solutions.

Repeated examination and calibration



For voltage testers over 1 kV, the period of repeated examination may not exceed 6 years. This is also recommended for voltage testers up to 1000V.

Depending on the area of application and the demands on the measuring and testing equipment, a repeated examination or a recalibration within a shorter period of time may be advisable.

We have very high demands on our measuring and testing equipment, which is subject to constant quality control. Most modern electronics and high-quality materials guarantee a long life.

If a tester shows a damage or malfunction, you can have it repaired quickly and unbu-reaucratically.

Repair



Please send back the device to:

Rudolph Tietzsch GmbH & Co. KG
Service
Willringhauser Str. 18
58256 Ennepetal

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Technical hotline:

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Mo. - Thu. 8:00 am - 4:00 pm

Fr. 8:00 am - 2:00 pm

Social responsibility



To assume social responsibility means to deal with ecological resources in a responsible manner. In this sense, we have developed completely maintenance-free voltage testers with innovative and particularly power-saving circuits. These work with all additional functions without batteries.

For production processes in our company, we have taken voluntary measures to reduce CO₂ emissions. We almost exclusively use regenerative energies.

Electricity, which can not be generated by own solar systems, is supplemented by regional green power.

Additionally we installed heat pumps, which operate with regenerative energy and therefore are a significant contribution to environmental protection.



aus der Region für die Region

Urkunde

Seit dem **1. April 2012** fördert die Firma
Rudolph Tietzsch GmbH & Co. KG
Willringhauser Straße 18
58256 Ennepetal

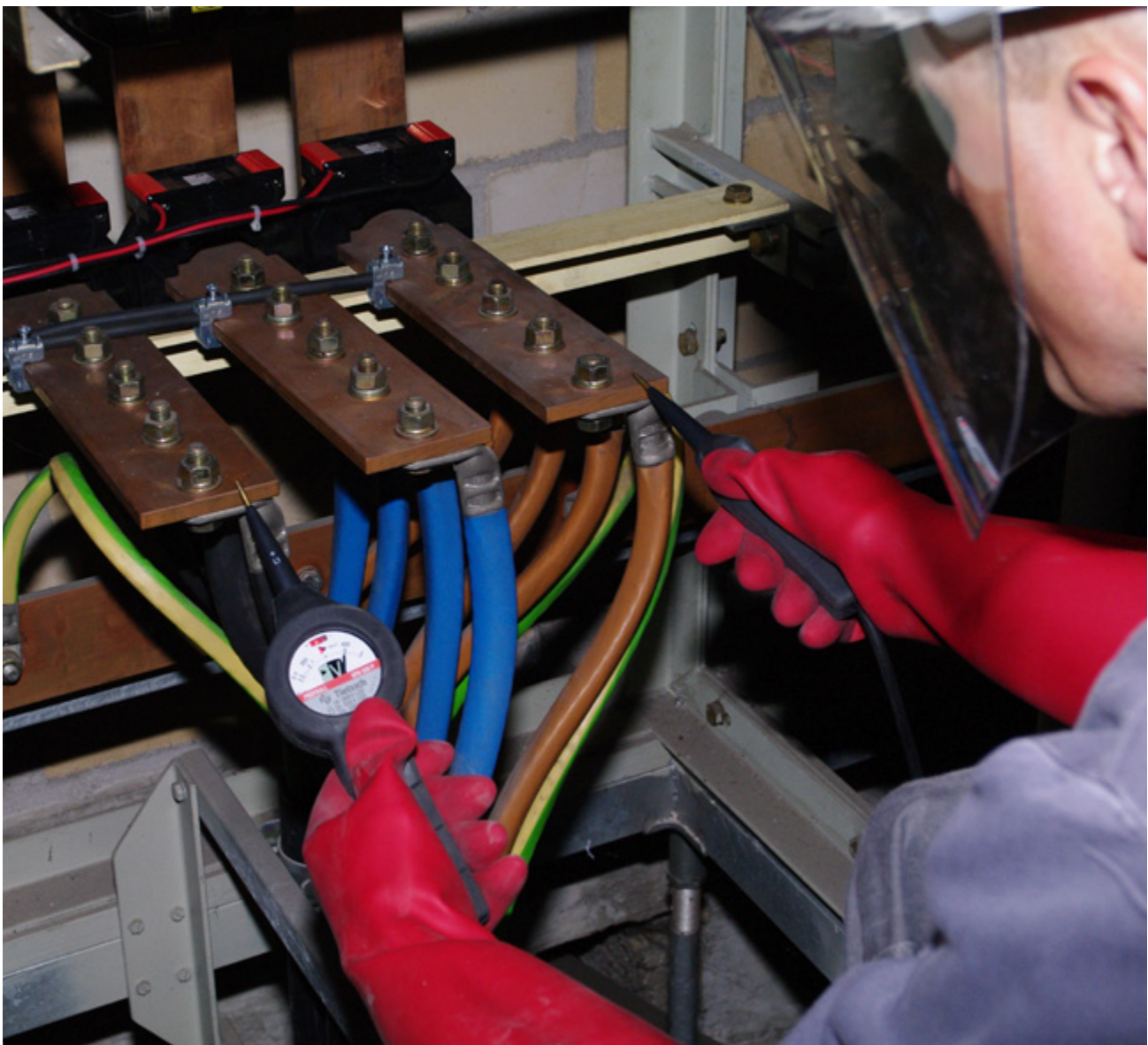
als grünstrom-Kunde Projekte und Modellvorhaben,
 die einen Beitrag zum Klimaschutz
 und zur Senkung der CO₂-Emmisionen leisten.

Gevensberg, 14. Dezember 2016


 Uwe Träris, Vorstand

AVU...
 ENergie – wir denken weiter

Voltage tester up to 1 kV



Type overview voltage tester up to 1 kV

Prüfball SPB Analog



Prüfball SPB Digital



- One-piece casing made of solid rubber
- Extremely safe and robust
- Maintenance-free without battery

- One-piece casing made of solid rubber
- Backlit LC-Display
- Maintenance-free due to Longlife battery

	500B	500PR	1000B	1000PR	500PRA
Indicating range	20-500 V		50-1000 V		20-500 V
Voltage warning LED without battery	■	■	■	■	■
Voltage indication with value without battery	■	■	■	■	■
Connectible load for 30 mA RCD		■		■	■
Connectible load for electricity meter					
Vibration at load		■		■	
Acoustic signal at load					■
Phase test single-pole	■	■	■	■	■
Phase sequence test	■	■	■	■	■
Continuity test	■	■	■	■	■
Resistance measuring device					
Frequency meter					
Front spot lighting					
Backlighting LCD					
Protection category	IP 65				
Power supply	without battery*				
Overvoltage category	CAT IV 500 V		CAT IV 1000 V		CAT IV 500V
VDE GS in accordance with IEC 61243-3	■	■	■	■	■
Article number	81411	81401	81414	81404	81402
Page	14				

	500L	1000L
Indicating range	50-500 V	50-1000 V
Voltage warning LED without battery	■	■
Voltage indication with value without battery	■	■
Connectible load for 30 mA RCD	■	■
Connectible load for electricity meter		
Vibration at load		
Acoustic signal at load		
Phase test single-pole	■	■
Phase sequence test	■	■
Continuity test	■	■
Resistance measuring device		
Frequency meter		
Front spot lighting		
Backlighting LCD	■	■
Protection category	IP 65	
Power supply	Longlife Battery**	
Overvoltage category	CAT IV 500 V	CAT IV 1000 V
VDE GS in accordance with IEC 61243-3	■	■
Article number	81422	81423
Page	16	

* Maintenance-free due to integrated Lithium accu for additional functions, which recharges during voltage tests

** Maintenance-free due to integrated Longlife battery for additional functions

Prüfball ZAP



- Robust rubber casing
- Integrated test for electricity meter
- Maintenance-free

MultiSafe DSP 4



- Precise display
- Large measuring range
- large illuminated LCD

MultiSafe DSP 5



- Precise display
- Very versatile
- 2-colour LC display

ProfiSafe LSP 4



- Compact
- Easy handling
- Maintenance-free without battery

ZAP 350	ZAP 350L	ZAP 1050L
20-500 V	50-500 V	
■	■	■
■	■	■
■	■	■
350 W		1050 W

■	■	■
■	■	■
■	■	■
■	■	■

IP 65		
without battery*	Longlife battery**	
CAT IV 300 V CAT III 500 V	CAT IV 500 V	
81314	81315	81316
20	22	

4	4F	4ST	4FST
0,1-1200 VAC / 1500 VDC			
■	■	■	■
■	■	■	■
■	■	■	■
1 - 1999 k Ω			
■	■	■	■
■	■	■	■
■	■	■	■

■	■	■	■
■	■	■	■
■	■	■	■
■	■	■	■
0,01 - 999 k Ω			
■	■	■	■
■	■	■	■
■	■	■	■

IP 65			
battery 9V 6LR61			
CAT IV 600 V CAT III 1000 V			
■	■	■	■
84402	84403	84405	84406
26			

5B	5	5ST
0,1-1200 VAC / 1500 V DC		
■	■	■
■	■	■
■	■	■
12 W		

■	■	■
■	■	■
■	■	■
■	■	■
0,01 - 999 k Ω		
■	■	■
■	■	■
■	■	■

IP 65		
battery 2x 1,5 V AAA		
CAT IV 1000 V		
■	■	■
84502	84501	84503
28		

LSP 4L	LSP 4B
12-690 V	
■	■
■	■
■	■
■	■

■	■
■	■
■	■
■	■

IP 65	
without battery*	
CAT IV 600 V CAT III 690 V	
■	■
85422	85421
30	

Prüfball SPB Analog

Extreme robust safety casing made of solid rubber



500 V or 1000 V measurement range available

NEW

Direct voltage indication
without push buttons! - CAT IV 1000V
Buttons only for additional load

B-Type without push buttons

The Prüfball SPB is the right voltage tester for operation in energy supply
- robust, precise, maintenance-free.

- One-piece safety casing made of solid rubber, extremely voltage-proof, unbreakable dust- and waterproof
- Easy operation, clear indication
- Phase, phase sequence and continuity tester, RCD-tripping
- Reliable phase sequence test by microcontroller analysis, possible with gloves
- Without battery, maintenance-free lifelong
- CAT IV 1000 V



EN/IEC 61243-3

CAT IV 1000 V



Approved safety concepts

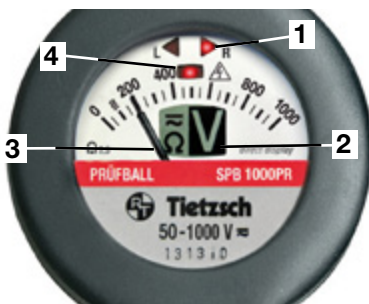
The case of solid rubber encloses the measuring system and switching mechanism:

- Impact resistant, shockproof
- Dust- and waterproof
- Overvoltage protection

Exact, precise display

Reliable test by three display systems:

- Direct indication without buttons by exact moving-iron instrument
- LCD-indicator
- LEDs



1. LED-triangle for phase sequence
2. LCD indicator with big V for hazardous voltage, type of voltage and continuity
3. Exact analog display, direct-display
4. LED-signal for hazardous voltage between 50 V AC / 120 V DC and for phase indication

Additional functions

- Reliable phase- and phase sequence test with new error detection for reliable indication, possible with gloves
- Continuity tester
- PR-type with additional load and vibration indication for tripping RCDs (Residual Current Device)
- PRA-type with additional load and acoustic signal for tripping RCDs (Residual Current Device)

Maintenance-free

The display of the voltage is supplied from the mains when checking. Also for the additional functions the Prüfball does not need a battery. The integrated Li-battery is charged with every voltage test.

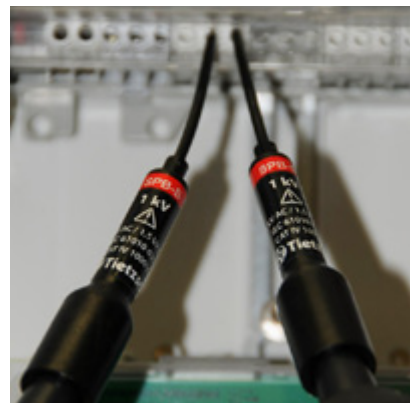


Extensions for higher safety during test at overhead lines and busbars

Wide range of accessories

Accessories are not included in scope of delivery

- Bage
- Extensions for tests at overhead lines
- Plastic casing for extensions
- Test prods for test objects difficult to access
- Insertion prods for underground cable
- Adapter for test lines with 4-mm-standard plug



Close contacts are well reached with flexible pin prods

Technical data

Two-pole voltage tester Prüfball SPB tested and certified by VDE in accordance with EN/IEC 61243-3 (VDE 0682 part 401)

Type / Nominal voltage

SPB 500B / PR / PRA	50 ... 500 V AC/DC
SPB 1000B / PR	50 ... 1000 V AC/DC

Display range scale

SPB 500PR/PRA	20 ... 500 V AC/DC
SPB 1000PR	50 ... 1000 V AC/DC

Frequency

0...100 Hz

Voltage indication

High-impedance, direct reading:
LCD-indicator, LED ≥ 50 V AC / 120 V DC moving-coil instrument, large 90°-scale
50 ... 500 V or 50 ... 1000 V, effective value accuracy cl 2,5: basic accuracy 2,5% + reading errors
⊕ low-impedance, switched additional load:
vibration-indicator in the handgrip > 180 V (for PR) acousticsignal (SPB 500PRA)
> 57 dB interval according to ISO 3744

Continuity

Ω -symbol in LCD 0 ... 1 M Ω

Phase / Phase sequence / Polarity

LED- and LCD triangle ≥ 165 V for phase unipolar
for phase sequence two-pole
type of voltage + / - / - by LCD signs

Input resistance

Direct:	SPB 500PR/PRA: 245 k Ω bei 500 V
	SPB 500B: 245 k Ω bei 500 V
	SPB 1000PR: 315 k Ω bei 1000 V
	SPB 1000B: 315 k Ω bei 1000 V
⊕ switched:	4,3...7 k Ω tripping of 30 mA-RCDs

Current peak value

Direct:	< 3,5 mA
⊕ switched:	< 300 mA at 1000 V 35 mA at 230 V - RCD-tripping

On-time

120 s

Overvoltage category

CAT IV 500 V / CAT IV 1000 V

Surge voltage strength

19,2 kV case insulation to user
12 kV circuit between test prods

Insulation test voltage

6 kV-unit inspection of case and line

Operating temperature

-15°C ... + 45°C

Power supply

Maintenance-free - without battery, test functions voltage and acoustic are supplied from the mains, continuity, phase and phase sequence by Li-storage, refreshable

Casing

Unbreakable silicone rubber, display cover made of indestructible polycarbonate

Protection category

IP 65, device can be used in moist environments

Line

PUR sheathed cable, 1000 V, 1m with protective cap for electrodes

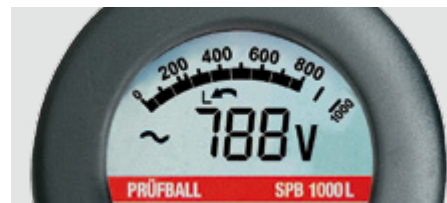
Dimensions / Weight

274 x 75 x 47 mm (display part) / 420 g

Type	Article no.	Phase- / phase sequence test	Continuity test	Additional load 30 mA-RCD-tripping	Vibration indication for load	Acoustic indication for load
SPB 500B 50-500 V	81411	■	■			
SPB 1000B 50-1000 V	81414	■	■			
SPB 500PR 50-500 V	81401	■	■	■	■	
SPB 1000PR 50-1000 V	81404	■	■	■	■	
SPB 500PRA 50-500 V	81402	■	■	■		■

Prüfball SPB Digital

Precise display in casing made of solid rubber



500 V- or 1000 V-LCD available

NEW

Switchable load now also with CAT IV 1000 V

The Prüfball SPB digital combines modern microcontroller applications with approved features of the analog Prüfball - robust, precise and maintenance-free

- One-piece safety casing made of solid rubber, extremely voltage proof, unbreakable, dust- and waterproof
- Direct reading of all functions without pressed buttons
- Phase, phase sequence and continuity test,
- Additional load (RCD-tripping)
- Reliable phase sequence test by microcontroller analysis, possible with gloves
- Maintenance-free
- CAT IV 1000 V



EN/IEC 61243-3

CAT IV 1000 V

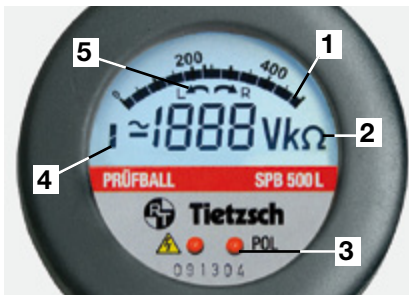


Direct voltage indication without pressed buttons

Clear indication

Reliable test by two display systems and connectible load:

- Bright LEDs and illuminated LCD
- High accuracy
- Additional load for tripping RCDs and to determine interference voltages



1. Bargraph
2. Large numerals and symbols for voltage AC/DC and resistance
3. LEDs
4. Indication of connected load
5. Arrows for phase sequence



LCD and LED indication when test prod applied to phase

Maintenance-free

The display is supplied from the mains while performing tests. The additional functions are powered by a Longlife battery.



Extensions for higher safety during test at overhead lines and busbars

Approved safety concepts

The case of solid rubber encloses the measuring system and switching mechanism:

- Impact resistant, shockproof
- Dust- and waterproof
- Overvoltage protection
- Current-limiting safety components for CAT IV 1000 V
- Safe two-hand operation for the low-resistance test with special switches with large contact distance

Wide range of accessories

Accessories are not included in scope of delivery

- Bags
- Extensions for tests at overhead lines
- Plastic sleeve for extensions
- Test prods for test objects difficult to access
- Insertion prods for underground cable
- Adapter for test lines with 4-mm-standard plug



Technical data

Two-pole voltage tester Prüfball SPB-L tested and certified by VDE in accordance with EN/IEC 61243-3 (VDE 0682 part 401)

Type / Nominal voltage

SPB 500L	50 ... 500 V AC/DC
SPB 1000L	50 ... 1000 V AC/DC

Display range

SPB 500L	50 ... 500 V AC/DC
SPB 1000L	50 ... 1000 V AC/DC

Frequency

0 - 2000 Hz

Voltage indication

high-impedance, direct reading:

LED ≥ 50 V AC and ≥ 120 V DC

LCD ≥ 50 V backlight

(accuracy 2,5 % + 5 digit)

⊕ low-impedance, switched:

symbol for connected load

Continuity

0 - 1000 k Ω (resolution 50 k Ω +/- 150 k Ω)

Phase / Phase sequence / Polarity

capacitive, without accessible electrode

arrows for phase sequence

POL for phase single-pole

tests possible with gloves

voltage type - / ~

Input resistance

direct: 500L: 150 - 190 k Ω ,

1000L: 300 - 350 k Ω

⊕ switched: 4,3...7 k Ω

Current peak value

direct: < 3,5 mA

⊕ switched: < 300 mA

(35 mA at 230 V - RCD-tripping)

On-time

120 s

Overvoltage category

CAT IV 500 V / CAT IV 1000 V

Surge voltage strength

19,2 kV case insulation to user

circuit between test prods:

8 kV, SPB 500L, 12 kV SPB 1000L

Insulation test

6 kV unit inspection of case and line

Operating temperature

-15°C ... + 45°C

Power supply

maintenance-free - without battery,

test functions voltage, phase sequence are

supplied from the mains,

continuity by Li-Longlife battery

Casing

unbreakable silicone rubber, display cover made of indestructible polycarbonate

Protection category

IP 65, device can be used in moist environments

Line

PUR sheathed cable, 1000 V, 1m

with protective cap for electrodes

Dimensions / Weight

274 x 75 x 47 mm (display part) / 415 g

Type	Article no.	Phase- / phase sequence test	Continuity test	Additional load 30 mA-RCD-tripping	LCD value
SPB 500L 50-500 V	81422	■	■	■	■
SPB 1000L 50-1000 V	81423	■	■	■	■

Prüfball SPB-HW for floods

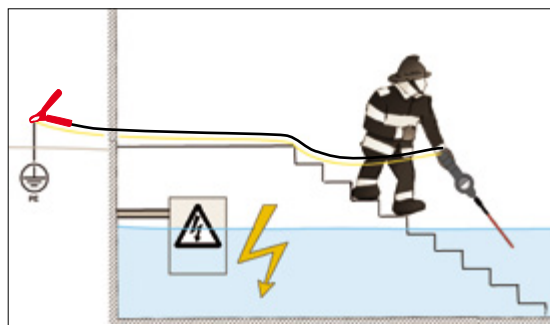
Determine absence of voltage in flooded cellars



- One-piece safety casing made of solid rubber, extremely impact resistant, dust- and waterproof
- Direct voltage indication by red LED and backlighted LCD
- Integrated self-test by green LED and LCD
- Perfectly readable in dark environments

Flooded electrical installations, such as house connections or feed-in of solar systems, can cause life-threatening voltage in the water. As soon as the safety elements are flooded, they cannot provide protection any longer.

The SPB-HW Prüfball warns the user against hazardous voltages before entering the hazard zone and inserting pumps.



Flooded electrical systems can lead to invisible hazards in the water.



Earthing with earth spike, connection by strain relieved clamp. Integrated self-test for earth connection.

Technical data SPB 500L-HW

Voltage testing

Two-pole by connected ground electrode, additionally single-pole in case of erroneous grounding

Nominal voltage

50 – 500 V AC/DC

Voltage indication

LED ≥ 50 V AC / 120 V DC
LCD ≥ 50 V backlighted

Self-test

Integrated self-test with checking proper ground connection

Casing

Unbreakable silicone rubber, display cover made of indestructible polycarbonate, IP 65

Earth connection

PUR sheathed cable, 1000 V, 30 m grounding terminal with safety rope

Extension

Insulated stainless steel tube, screwable, 60 cm

Dimensions / Weight

180 x 240 x 360 mm / 3,2 kg (set)

Type	Article no.	Self-test	Test of ground connection	500 mm extension	Screw clamp for mast	Bag	Earth spike
SPB 500L-HW 50 - 500 V	81317	■	■	■			
SET SPB-HW 50 - 500 V	81417	■	■	■	■	■	

Prüfball SPB-UB for subways

Voltage testing on railways with a third rail

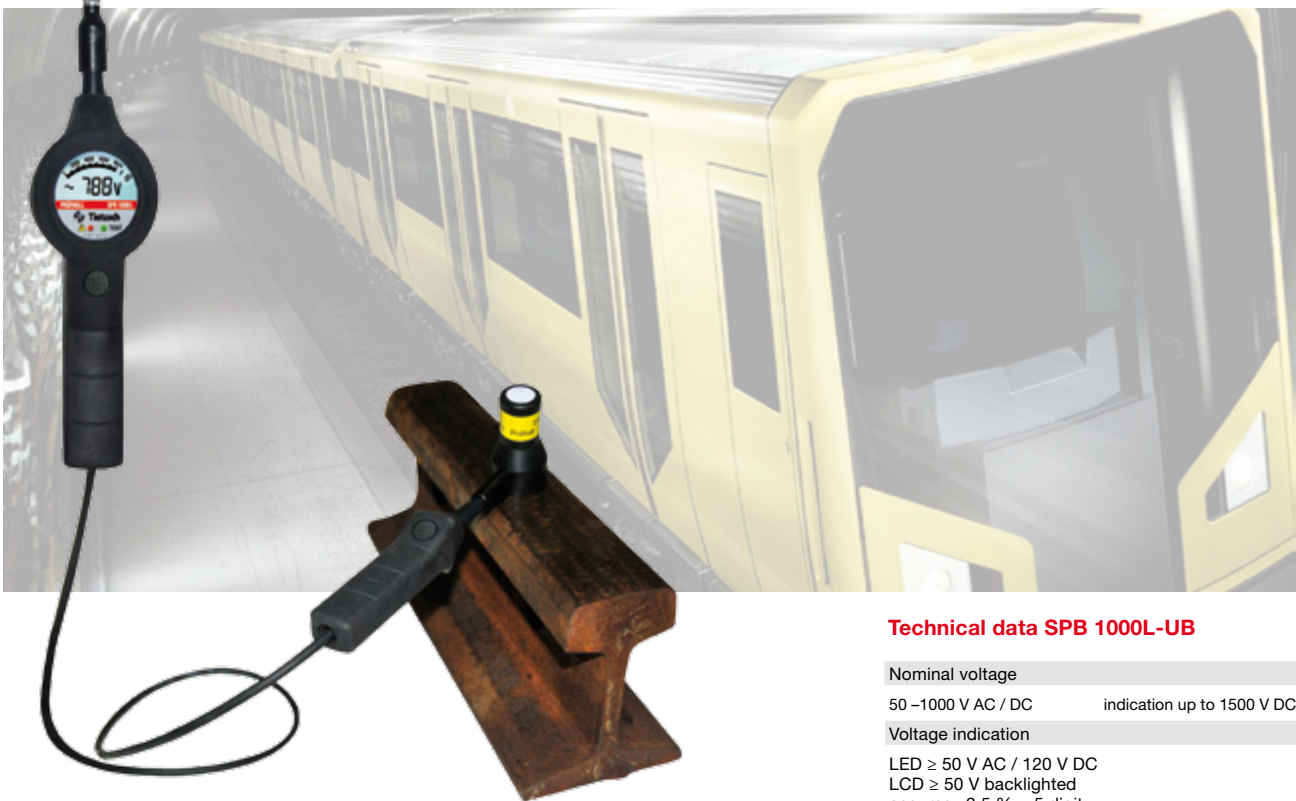
NEW

with switchable load to determine interference voltage - CAT IV 1000 V

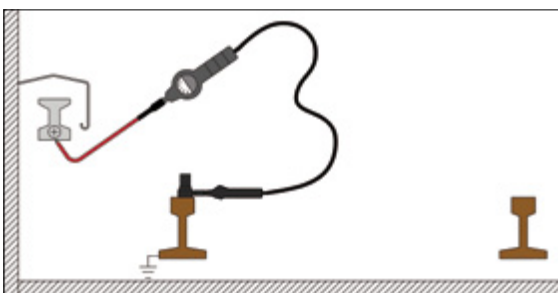


EN/IEC 61243-3
CAT IV 1000 V

- One-piece safety casing made of solid rubber, extremely impact resistant, dust- and waterproof
- Highest safety against surge voltage CAT IV, 1000 V
- Direct voltage indication by red LED and backlighted LCD
- Integrated self-test by green LED and LCD
- Extension and magnet for easy testing at third rails



The two-pole voltage tester SPB 1000L-UB makes it easier to check the third rail at the side. The angled extension increases the safety during tests.



With the magnet, the SPB-UB can be attached to the drive rail on one side. With the switchable load up to 1000 V, interference voltages can be reliably detected.

Technical data SPB 1000L-UB

Nominal voltage

50 - 1000 V AC / DC indication up to 1500 V DC

Voltage indication

LED ≥ 50 V AC / 120 V DC
LCD ≥ 50 V backlighted
accuracy 2,5 % + 5 digit

Self-test

Green LED for test of contact to the earth

Additional load

Push buttons for load (7k Ω) ,
LCD symbol as load indication

Casing

Unbreakable silicone rubber, display cover made of indestructible polycarbonate, IP 65

Earth connection

PUR sheathed cable, 1000 V AC / 1500 V DC, 1 m

Accessories

Insulated stainless steel tube, attachable, L-formed, 250 mm, magnet for rail

Dimension / Weight

274 x 75 x 47 mm / 400 g (basic)

Type	Article no.	Self-test with green LED	Single pole voltage warning	Additional load, to determine interference voltage	LCD value	Angled extension	Magnet for rail
SPB 1000L-UB 50 - 1000V	81391	■	■	■	■		
SET SPB-UB 50 - 1000V	81390	■	■	■	■	■	■

Prüfball ZAP 350 Analog

Electricity meter tester with 350 W load



NEW direct voltage indication
without push buttons!

The Prüfball ZAP 350 is an extremely safe testing device for fast start-up tests at initial operation of electricity meters, combined with a high-quality voltage tester.

- Direct indication of voltage up to 500 V
- Connectible load of 350 W for fast start-up tests of electricity meters
- Phase, phase sequence and continuity tester
- Thermal and overvoltage protection
- Without battery, maintenance-free lifelong



Integrated 350W-load for fast start-up tests at electricity meters

Universal testing device for meter installation and power suppliers

Five important functions combined in one device

- Electricity meter tester for all directly measuring electricity meters
- Voltage tester 50 - 500 V
- Phase tester
- Phase sequence tester
- Continuity and self-tester

Technology and safety

High-quality elements guarantee operation and safety under extreme conditions

- Solid rubber case, dust- and waterproof IP 65
- Overvoltage protection – CAT IV
- Maintenance-free - no battery required
- Secure two-hand tripping device for low resistive checks through special push button with wide contact gap in both handles
- Integrated thermo-switch to avoid overheating at multiple use
- Voltage monitoring as protection against mistakes in voltage ranges (phase/phase) during load tests

Exact, precise display

Reliable test by three display systems and connectible load:

- Direct indication by LCD indicator and LEDs at 50 V
- Direct indication of analog measuring system
- Direct indication of load with 350 W by load-LED 1,5 A
- High accuracy through moving-coil instrument class 2,5



ZAP - line

The patented special cable allows space-saving and water-protected design

- Fast start-up test through high power
- No overheating of device or handles
- Enclosed casing without ventilation

Accessories

Accessories are not included in scope of delivery

- Bag of leather or artificial leather keeping the ZAP in the bag avoid bending the connection line
- Pin prod for tight contacts (see accessories for Prüfball SPB)



Flexible pin prods for tight contacts



Technical data

Electricity meter and voltage tester ZAP 350 according to EN/IEC 61243-3 with special cable in accordance with BG test report

Nominal voltage

50 ... 500 V AC/DC

Display range

50 ... 500 V AC/DC

Frequency

0...100 Hz

Voltage indication

High-impedance, direct reading:
1 LED and LCD-indicator ≥ 50 V,
moving-coil instrument 50 ... 500 V
CI 2,5: basic accuracy 2,5 % + reading errors
large 90°-scale, effective value display
⊕ low resistive connected: load LED 1,5 A

Continuity

Ω-symbol in LCD 0 ... 1 MΩ
automatic switch-over to voltage

Phase / Phase sequence

LED- and LCD-triangle ≥ 165 V
for phase single-pole and
for phase sequence two-pole

Input resistance

Direct (high-impedance) 245 kΩ

⊕ switched load for start-up test 150 Ω

Current peak value

< 30 mA / 500 V
with connected load approx. 1,5 A / 230 V

On-time

120 s

Connectible load

Approx. 350 W at 230 V

Overvoltage protection

Automatic switch-off of load at > 260 V

Overload protection

Thermo-switch, thermo-point at >70°C

Overvoltage category

CAT IV 300 V in accordance with
IEC 60664-1 (VDE 0110)

Surge voltage strength

8 kV case insulation to user
6 kV circuit between test prods

Insulation test voltage

6 kV unit inspection of case and line

Operating temperature

-15°C ... + 45°C

Power supply

Maintenance-free - without battery,
test functions voltage, phase sequence and acoustic signal are supplied from the mains,
continuity by Li-storage, refreshable

Casing

Unbreakable silicone rubber, display cover made of indestructible polycarbonate

Protection category

IP 65, device can be used in moist environments

Line

Patented thermo-line Ø 10 mm / 1,8 m,
twin insulated, PA-thermo protection meshwork

Dimensions / Weight

274 x 75 x 47 mm (display part) / 515 g

Type	Article no.	Phase- / phase sequence test	Continuity test	Additional load	Direct analog indication
ZAP 350 50-500V	81314	■	■	350 w	■

Prüfball ZAP 350L / 1050L Digital

Electricity meter tester with 350 W or 1050 W load



The Prüfball ZAP digital is an extremely safe testing device for fast start-up tests at initial operation of electricity meters, combined with a high-quality voltage tester.

- Direct indication of voltages up to 500 V
- Connectible load of 350/1050 W for fast start-up tests
- Phase, phase sequence and continuity tester
- Thermal and overvoltage protection
- Without battery, maintenance-free lifelong

Universal testing device for meter installation and power suppliers

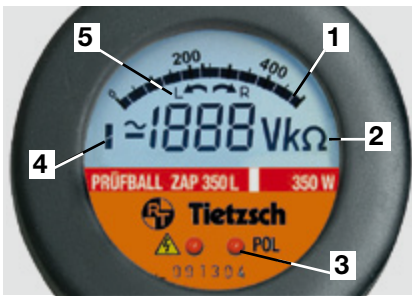
Five important functions combined in one device

- Electricity meter tester for all directly measuring electricity meters
- Voltage tester 50 ... 500 V
- Phase tester
- Phase sequence tester
- Continuity and self-tester

Exact, precise display

Reliable test by two display systems and connectible load:

- Direct indication by LEDs and LCD at 50 V
- Connection of start-up load
- Clear indication of load
- High accuracy



1. Bargraph
2. Large numerals and symbols for voltage AC/DC and resistance
3. Light diodes
4. Indication of connected load
5. Arrow for phase sequence
Indication if one test prod is applied to phase



LCD and LED

Technology and safety

High-quality elements guarantee operation and safety under extreme conditions

- Solid rubber case, dust- and waterproof IP 65
- Overvoltage protection – CAT IV
- Maintenance-free - no battery required
- Secure two-hand tripping device for low resistive checks through special push button with wide contact gap in both handles
- Thermo-switch to avoid overheating at multiple use
- Voltage monitoring as protection against mistakes in voltage ranges (phase/phase) during load tests

Maintenance-free

The display of the voltage is supplied from the mains when checking. The additional functions are powered by a Longlife battery.



Integrated load up to 1050 W for fast start-up of electricity meters.

ZAP - line

The patented special cable allows space-saving and water-protected design

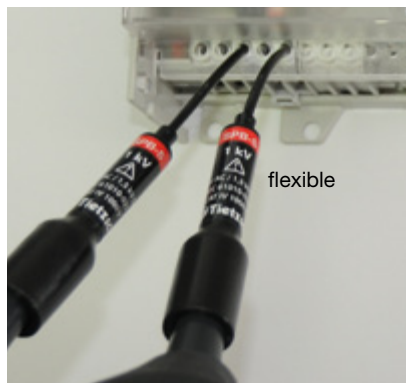
- Fast start-up through high capacity
- No overheating of device or handles
- Enclosed casing without ventilation



Accessories

Accessories are not included in scope of delivery

- Bag of leather or artificial leather
Keeping the ZAP in the bag avoid bending the connection lead
- Pin prod for tight contacts
(see accessories for Prüfball SPB)



Technical data

Electricity meter and voltage tester ZAP 350L according to EN/IEC 61243-3 with special cable in accordance with BG test report

ZAP 1050L

Nominal voltage	50 ... 500 V AC/DC
Display range	50 ... 500 V AC/DC
Frequency	0...2000 Hz
Voltage indication	High-impedance, direct reading: LED ≥ 50 V ~ and ≥ 120 V +- LCD ≥ 50 V backlighted (accuracy 2,5 % + 5 Digit)
	⊕ low resistive switched: additional display symbol for connected load
Continuity	0 ... 1000 k Ω (resolution 50 k Ω +/- 150 k Ω)
Phase / Phase sequence / Polarity	Capacitive, without accessible electrode arrows for phase sequence POL for phase single-pole tests possible with gloves voltage type - / ~
Input resistance	Direct (high-impedance) approx. 150 - 190 k Ω ⊕ switched: (start-up test) 150 Ω 50 Ω
Current peak value	Direct: < 3,5 mA ⊕ switched: 1,5 A / 230 V 4,6 A / 230 V
On-time	120 s
Connectible capacity	Approx. 350 W at 230 V approx. 1050 W at 230 V
Overvoltage protection	Automatic switch-off of load at > 260 V
Overload protection	Thermo-switch, thermo-point at approx 70°C
Overvoltage category	CAT IV 500V according to IEC 60664-1 (VDE 0110)
Surge voltage strength	12 kV case insulation to user 8 kV circuit between test prods
Insulation test voltage	6 kV unit inspection of case and line
Operating temperature	-15°C ... + 45°C
Power supply	Maintenance-free - without battery, test functions voltage, phase sequence is supplied from the mains, continuity by Li-accu with automatic charging function
Casing	Unbreakable silicone rubber, display cover made of indestructible polycarbonate
Protection category	IP 65, device can be used in moist environments
Line	Patented thermo-line \varnothing 10 mm / 1,8 m \varnothing 15 mm / 1,8 m twin insulated, PA-thermo protection meshwork
Dimensions / Weight	274 x 75 x 47 mm (display part) / 510 g 720 g

Type	Article no.	Phase- / phase sequence test	Continuity test	Additional load	LCD display with value
ZAP 350L 50-500V	81315	■	■	350 w	■
ZAP 1050L 50-500V	81316	■	■	1050 w	■

Accessories Prüfball SPB / ZAP



The Prüfball SPB and ZAP is equipped with a thread for fast and safe extension with test probes. With the test probes, the Prüfball can be used perfectly and safely in various applications.

Extensions

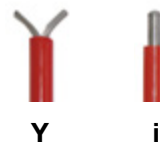


With screwed-on extensions, it is possible to work at a safe distance from open circuits and current rails in switchgear.

Nominal voltage
50 ... 1000 V AC / 1500 V DC

Insulating strength
> 6000 V

shape of electrodes



81020 SPB-S500-Y 500 mm

81022 SPB-S600-Y 600 mm

81028 SPB-S900-Y 900 mm



Flexible pin prods



With screwed pin prods tight terminal strips or contacts at test holes can be contacted.

In addition, the bare electrode length is shortened to <math><4\text{ mm}</math> in order to minimize the risk of short circuits in narrow switchgears.

Nominal voltage
50 ... 1000 V AC / 1500 V DC

Insulating strength
> 6000 V

flex



81023 SPB-S70 Flexible pin prod 65 mm



Adapter and accessories



The Prüfball SPB can be used with adapters, cables and accessories for various test tasks.

81041 SP 200 Testbox



84311 L-SETR Test line



81029 SPB-S-ADA Screwable adapter with 4 mm socket



81021 SPB-S20-A Insertion prod 20 mm



Bags and storage



Various bags and containers facilitate the transport and protect the Prüfball SPB and accessories.

81031 S-HUELSE Plastic sleeve for extension and test probes



Bags for every requirement on page 68



MultiSafe DSP 4

Precise indication up to 1200 V AC / 1500 V DC



DSP 4-F
with **push button F** for:
phase sequence tests in ungrounded
mains, frequency measurement or data hold



DSP 4ST - Slide tip
with adjustable electrode length to
4 mm or 16 mm.

The MultiSafe DSP 4 is a safe testing device for all applications in power engineering – easy handling, precise, reliable.

- Precise indication of voltage from 1 V up to 1200 V AC
10 mV up to 1500 V DC
- Phase and phase sequence tests (possible with gloves)
continuity tester 1 kΩ up to 2000 kΩ
- Highest degree of safety provided by protective resistors in both test prods
- Easy operation
large illuminated display



EN/IEC 61243-3
CAT IV 600 V



Many test-functions

Fast and safe measuring and testing of:

- Direct and alternating voltage
- Resistance / continuity
- Polarity
- Phase
- Phase sequence grounded

DSP 4-F additionally:

- Phase sequence test ungrounded for IT mains
- Frequency measurement

Easy operation

Fully automated test procedures obviate operating errors:

- At 24 V the MultiSafe switches on, or from continuity over to voltage testing
- Automatic selection of correct measurement range
- Indication of voltage and polarity
- Self-test per keypress
- Hold-function

Three readout systems

Unambiguous and rapid recognition of function and result:

- Round red flares for voltage, green square symbol for resistance and two red triangles for phase sequence.
- The display shows precise values in V or kΩ as well as voltage type and polarity
- An acoustic signal indicates continuity up to 10 kΩ.

Robust design

High-quality elements guarantee function and safety under extreme conditions:

- Impact resistant plastic casing and break-proof display cover
- Dust- and waterproof (IP 65, approved for operation in outdoor areas)
- Spring-mounted test contacts
- Twin insulated PUR control cable



Highest level of safety

- Protective resistors located directly behind both test electrodes protect user and device especially against dangerous voltage peaks and energy from external sources
- Clear LED indication of hazardous voltages > 50 V AC / 120 V DC, which works without battery
- The MultiSafe has been tested and certified by VDE

Phase sequence test

- Exact phase sequence test in grounded mains from 165 V up to 1200 V / 50 Hz by microcontroller analysis.
- The phase sequence test is possible with gloves.

DSP 4-F additionally:

- New measuring principle for phase sequence tests works also in unearthed mains, applicable for IT mains

Safety accessories

Accessories are not included in scope of delivery

- Pin prod, adapter and extensions (page 32)



Technical data

Two-pole voltage tester

MultiSafe DSP 4 / DSP 4-F tested and certified by VDE in accordance with EN/IEC 61243-3 (VDE 0682 part 401)

Nominal voltage

24 ... 1000 V AC / 1500 V DC
(according to VDE: automatic switch on/over at ≥ 24 V)

Display range

0,01 V ... 1500 V DC
1 V ... 1200 V AC

Frequency

15 Hz ... 10 kHz < 500 V, 15 Hz ... 4 kHz > 500 V

Indication of voltage/phase/phase sequence

4 LEDs for voltage, continuity, phase sequence
LCD digital indication, backlighted
7-segment display, 2 lines, 0 ... 1999 digit

Measuring ranges - voltage

DC: 0,01...8,99/9,0...99,9/100...1500 V (1,5% + 3 D)
AC: 1...99,9/100...1200 V (1,5% + 3 D)
(TRMS 15...1800 Hz)
15...1200 V (15% + 3 D)
(sineff >1,8...4/10 kHz)

Indication of resistance/continuity/diodes

Green LED for continuity up to 1999 kΩ and diodes,
LCD 3½-digit for kΩ-measurement value
buzzer ≤ 10 kΩ

Measuring range - resistance

0 ... 1999 kΩ (5 % + 3 D)

Measuring ranges - frequency

Only DSP 4-F: 15 ... 1999 Hz, 2,00 ... 10,00 kHz

Input resistance

412 kΩ at 50 V / 50 Hz
311 kΩ at 1000 V AC, 720 kΩ at 1000 V DC
protective resistors directly behind both test electrodes

Current peak value

3,2 mA at 1000 V

On-time

30 s

Overvoltage category

CAT IV 600 V / CAT III 1000 V
in accordance with IEC 60664-1 (VDE 0110)

Surge voltage strength

>12 kV case insulation to user
> 8 kV circuit between test prods

Insulation test voltage

6 kV unit inspection of case and line

Operating temperature

-15°C ... +45°C

Standards

DSP 4/DSP 4-F: EN/IEC 61243-3 (VDE 0682 Teil 401)
DSP 4ST: additionally according to UK HSE GS38
DSP 4UL: UL 61010-1, 3rd Edition
CAN/CSA-C22.2 No. 61010-1, 3rd Edition

Power supply

9 V-block IEC 6LR61 / 6LF22 / 6LP3146 energy-saving circuit, automatic switch-off after 30 s without measuring, multi-stage battery indicator

Casing

ABS, display cover PC impact resistant, test electrodes spring-mounted

Protection category

IP 65, device can be used in moist environments

Line

PUR sheathed cable, 1000 V, 1 m with protective cap for electrodes

Dimensions / Weight

240 x 62 x 39 mm (display part) / 270 g

Type	Article no.	Phase- / phase sequence test	Phase sequence test for IT power grids	Continuity test with value	Additional load 30 mA-RCD-tripping	Slide tip 4 / 16 mm
DSP 4 0,3 - 1200 V AC 0,01 - 1500 V DC	84402	■		■		
DSP 4-F 0,3 - 1200 V AC 0,01 - 1500 V DC	84403	■	■	■		
DSP 4ST 0,3 - 1200 V AC 0,01 - 1500 V DC	84405	■		■		■
DSP 4 FST 0,3 - 1200 V AC 0,01 - 1500 V DC	84406	■	■	■		■

MultiSafe DSP 5

Highest precision and safety up to 1200 V AC / 1500 V DC



NEW



DSP 5ST - Slide tip with adjustable electrode length 4 mm / 16 mm.



Colour change of the LCD lighting during voltage

Der MultiSafe DSP 5 is a safe testing device for all applications in power engineering - easy handling, high-precision, multifunctional and reliable.

- Precise indication of voltage from 100 mV up to 1200 V AC
10 mV up to 1500 V DC
- Extended measuring range for low- and battery-voltage up to 19,99 V
- Phase, phase sequence tester (possible with gloves)
- Fast continuity test 0,01 kΩ up to 1000 kΩ
- Easy operation, large illuminated display with two colour display
- Additional load to determine interference voltages and RCD-tripping (not DSP 5B)



EN/IEC 61243-3

CAT IV 1000 V



Many functions

Fast and safe measuring and testing of:

- Direct and alternating voltage (TRMS)
- Resistance / continuity
- Polarity
- Phase
- Phase sequence grounded from 165 up to 1200 V / 50 Hz
- Phase sequence ungrounded (IT power grids)
- Frequency measurement
- Monitored additional load / RCD-tripping (not DSP 5B)
- Additional load for start-up tests of electronic electricity meters
- Front spot point lighting

Easy operation

Fully automated test procedures obviate operating errors:

- The MultiSafe DSP 5 switches on, or from continuity over to voltage testing
- Direct indication of the type of voltage / polarity / frequency
- Automatic range selection from 0,10 V up to 1500 V
- Integrated self-test per keypress
- One-hand operation for testing sockets
- Integrated flashlight function for working in any environment
- Belt clip for easy transport

Robust design

High-quality elements guarantee function and safety under extreme conditions:

- Impact resistant plastic casing and break-proof display cover
- Dust- and waterproof (IP 65, approved for operation in outdoor areas)
- Tightly integrated test contacts
- Twin insulated PUR control cable



Additional load / RCD-tripping, backwards

Highest level of safety

- Large protective resistors protect the user and device especially against dangerous voltage peaks and energy from external sources.
- Large two-colour display for hazardous voltages > 50 V AC / 120 V DC, and LED-warning which works without battery
- The MultiSafe has been tested and certified by VDE

Safety accessories

Accessories are not included in scope of delivery

- Pin prods for measuring points that are difficult to reach
- Adapter for test lines with 4 mm plug
- Extensions for overhead lines



Front spot lighting

Technical data

Two-pole voltage- and continuity tester
MultiSafe DSP 5 / DSP 5B / DSP 5ST
tested and certified by VDE in accordance with
EN/IEC 61243-3 (VDE 0682 part 401)

Nominal voltage

12 ... 1000 V AC / 1200 V DC DSP 5 / DSP 5ST
12 ... 1000 V AC / 1500 V DC DSP 5B
(according to VDE: automatic switch on / over >12 V
and additional load up to max. 1200 V AC / DC)

Display range

0,01 V ... 1500 V DC
0,10 V ... 1200 V AC

Frequency

15 Hz ... 10 kHz < 500 V,
15 Hz ... 2 kHz > 500 V

Indication of voltage/phase/phase sequence

Red LED for voltage, green for continuity, yellow for
phase sequence, LC display, two color backlighted
7-segment-letters, 2 lines, 0 ... 1999 Digit

Measuring ranges - voltage

DC: 0,01...19,99/20,0...99,9/100...1500 (1,5% + 3 D)
AC: 0,10...19,99/20,0...99,9/100...1200 V
TRMS 15... 500 Hz (1,5% + 3 D)
sineff > 500 Hz (15% + 3 D)

Indication of resistance/continuity/diodes

Green LED for continuity up to 1000 kΩ
and diodes, LCD 3½-digit for kΩ-measurement
value, buzzer ≤ 10,00 kΩ

Measuring range - resistance

0,01 ... 1000 kΩ (5 % + 4 D)

Measuring ranges - frequency

15,0 ... 99,9 Hz / 100 ... 9999 Hz

Input resistance

412 kΩ at 50 V / 50 Hz
200 kΩ at 1000 V AC, 720 kΩ at 1000 V DC

Current peak value

5 mA at 1000 V direct
< 300 mA at 1000 V switched (not for DSP 5B)

On-time t_{on} / recover-time t_{off}

at 230 V / 400 V unlimited
at U_N 2 min t_{on} / 2 min t_{off}

Overvoltage category

CAT IV 1000 V
in accordance with IEC 60664-1 (VDE 0110)

Surge voltage strength

>19,2 kV case insulation to user
>12 kV circuit between test prods

Insulation test voltage

6 kV unit inspection of case and line

Operating temperature

-15°C ... + 55°C

Power supply

2 x 1,5 V AAA energy- saving circuit,
automatic switch-off after 30 s without measuring
multi-stage battery indicator

Casing

ABS-PC/ TPE , display cover PC impact resistant,
handgrip to clip in, belt clip

Protection category

IP 65, device can be used in moist environments

Connection line

PUR sheathed cable, 1000 V, 1 m, with protective cap

Repeated inspection / calibration

Recommended every 6 years

Dimensions / Weight

275 x 89 x 35 mm (handgrip and display part)
275 x 60 x 35 mm (display part)
270 g

Type	Article no.	Phase-/ phase sequence test	Phase sequence test for IT power grids	Continuity test with value	Additional load 30 mA-RCD-tripping	4 / 16 mm slide tip
DSP 5B 0,3 - 1200 V AC 0,01 - 1500 V DC	84502	■	■	■		
DSP 5 0,3 - 1200 V AC 0,01 - 1500 V DC	84501	■	■	■	■	
DSP 5ST 0,3 - 1200 V AC 0,01 - 1500 V DC	84503	■	■	■	■	■

ProfiSafe LSP 4

Compact and maintenance-free voltage tester



LSP 4B with bargraph

The ProfiSafe LSP 4 is an particularly managable and safe tester without battery, maintenance-free and environmentally friendly

- Voltage indication by LED and backlighted LCD
- Phase, phase sequence and continuity test
- Reliable phase sequence test by microcontroller analysis, test possible with gloves
- Without battery, maintenance-free lifelong



EN/IEC 61243-3
CAT IV 600 V



Five test functions

Fast and safe testing of:

- Direct and alternating current
- Continuity
- Polarity
- Phase
- Phase sequence

Highest level of safety

With CAT IV / 600 V, the device is in the highest overvoltage category, and can be used in all areas of energy engineering. The ProfiSafe has been tested and certified by VDE.

Clear signals

Unambiguous and rapid recognition:

- Red round LED warns against hazardous voltages
- Green square symbol for continuity
- Backlighting display for all functions

Maintenance-free

Lifelong indication of continuity, phase and phase sequence – function without battery

- Voltage tests can always be performed power supply from the mains
- Without battery, maintenance-free lifelong environmentally friendly
- Power supply for continuity, phase and phase sequence from highperformance accu
- Accu is charged automatically during voltage tests

Robust design

High-quality elements guarantee function and safety under extreme conditions:

- Impact resistant plastic casing
- Dust- and waterproof (IP 65, approved for operation in outdoor areas)
- Spring-mounted test contacts
- Twin insulated PUR control cable

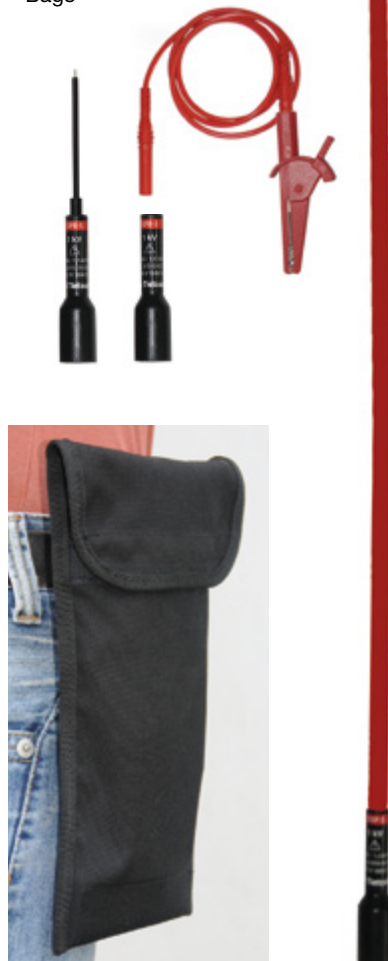
Two models to choose

- LSP 4B with bargraph in 7 steps
- LSP 4L with digital display in 1-Volt steps

Accessories

Accessories are not included in scope of delivery

- Extensions
- Flexible pin prods
- Adapter
- Bags



Technical data

Two-pole voltage tester ProfiSafe LSP 4B / 4L tested and certified by VDE in accordance with EN/IEC 61243-3 (VDE 0682 part 401)

Nominal voltage range	12 ... 690 V AC / DC
Nominal frequency range	0 ... 500 Hz
Display range	LSP 4B 7 steps (bargraph) 12, 24, 50, 120, 230, 400, 690 V LSP 4L DC: 12 ... 690 V ($\pm 3\% + 4 D$) AC: 12 ... 690 V ($\pm 3\% + 4 D$)
Continuity	0 ... 1 M Ω
Input resistance	Approx. 167 k Ω AC / DC at 690 V approx. 200 k Ω AC / DC at 50 V
Current peak value I _s	4,2 mA at 690 V AC / DC
On-time	TR _{on} 30 s at 690 V RT _{off} max. 240 s (recovery time)
Display	Red LED for voltage ≥ 50 V AC / 120 V DC green LED for continuity 0 ... 1000 k Ω LCD with backlight measuring rate 2/s
Power supply	Maintenance-free – without battery voltage tests from the mains functions continuity / phase / phase sequence by integrated Li-accu
Overvoltage category	CAT IV 600 V / CAT III 690 V
Surge voltage strength	> 12 kV case insulation to user > 8 kV circuit between test electrodes
Insulation test voltage	6 kV unit inspection of case and line
Operating temperatures	-15°C ... + 45°C
Casing	Impact resistant, dust proof ABS plastic casing display cover made of polycarbonate
Protection category	IP 65
Connecting line	PUR sheathed cable, 1000 V, 1 m with protective cap for electrodes
Standards	IEC 61243-3:2009 EN 61243-3:2010 DIN-EN 61243-3:2011
EMV requirements	DIN-EN 61326
Dimensions / Weight	231 x 48 x 37 mm (display part) / 170 g

Type	Article no.	Phase- / phase sequence test	Continuity test	Additional load 30 mA-RCD-tripping	LCD bargraph	LCD value
LSP 4B 12 - 690 V	84502	■	■		■	
LSP 4L 12 - 690 V	84501	■	■			■

Accessories MultiSafe DSP / ProfiSafe LSP



- Standard probe without thread
DSP 4 / DSP 4F / LSP 4

Only attachable DSP-accessories can be used.



- Standard probe with thread set
DSP 4 / DSP 4F / LSP 4

Attachable DSP-accessories **or** screwable DSP accessories can be used.



- Slide-tip probe with thread set
DSP 4ST / DSP 4FST / DSP 4UL

Only screwable DSP-accessories can be used.

Extensions

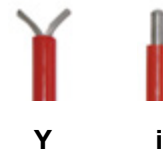


With screwed-on extensions, it is possible to work at a safe distance from open circuits and current rails in switchgear.

Nominal voltage
50 ... 1000 V AC / 1500 V DC

Insulating strength
> 6000 V

shape of electrodes



84313 LSP-S500-Y 500 mm attachable

84010 DSP-S500-Y 500 mm screwable

84014 DSP-S940-Y 900 mm screwable



Flexible pin prods



With screwed pin prods tight terminal strips or contacts at test holes can be contacted.

In addition, the bare electrode length is shortened to <4 mm in order to minimize the risk of short circuits in narrow switchgear.

Nominal voltage
50 ... 1000 V AC / 1500 V DC

Insulating strength
> 6000 V



84013 DSP-S70 flexible pin prod 58 mm attachable



84318 DSP-S120 flexible pin prod 110 mm screwable



Adapter and accessories



The MultiSafe DSP can be used with adapters, cables and accessories for various test tasks.

81041 SP 200 Testbox



84311 L-SETR Test line



84312 DSP-S-ADAS Screwable adapter with 4 mm socket



84321 DSP-S20-A Insertion prod 20 mm screwable



Bags and storage



Various bags and containers facilitate the transport and protect the MultiSafe DSP and accessories.

81031 S-HUELSE Plastic sleeve to store extensions



Bags for every requirement on page 68



MultiSafe TT 1

Telescope voltage tester for light rail systems

NEW



Variable locking



Display unit with 360 ° LED light strip red / green and two colour LC-display



The MultiSafe DSP TT1 is a safe equipment for fast voltage testing at overhead lines of light rail systems.

- Precise indication of voltage up to 1000 V AC / 1500 V DC
- Testing height up to 6,2 m variable height adjustment
- Highest degree of safety provided by protective resistors within the test prod, maximum current below 3,2 mA
- Easy operation with one single push button, self-test for testing function, protective resistors and proper ground connection
- Interchangeable test line with magnet or clamp

Application

The MultiSafe TT 1 is a two-pole telescope voltage tester for voltages up to 1000 V AC / 1500 V DC.

It is particularly suitable to detect quickly and securely voltage at catenary lines of light rail systems.



Direct indication of voltage on the LCD and warning by LED and acoustic signal.

Easy operation

Easy test sequence in three steps:

1. Place the contact magnet on the grounded rail or screw the contact clamp on the rail foot
2. Perform the selftest
3. Pull out the telescope for length and insert the electrode into the overhead line.

Three display systems

- LEDs red for voltage, green for standby and absence of voltage
- Display for voltage value, frequency as well as voltage type and polarity
- Acoustic signal for voltage $> U_t$

Robust design

High-quality elements guarantee function and safety:

- 4-part GRP-telescope tube with variable height adjustment
- Display part made of impact resistant plastic with break-proof display cover
- Dust- and waterproof
- Solid PUR hose cable with contact magnet or clamp, easily exchangeable

Accessories

Accessories are not included in scope of delivery

- Bag with ring bolt and shoulder belt
- Wall holder
- Robust case



bag

wall holder

case



Fast self-test for device function and contact between terminal and rail
MultiSafe TT 1K - with rail foot clamp

alternatively:



MultiSafe TT 1M - with magnet for rail

Technical data

MultiSafe TT 1, telescope voltage tester for light railway overhead lines

Nominal voltage range	50 ... 1000 V AC / 1500 V DC
Display range	30 ... 1000 V AC / 1500 V DC
Frequency range	0 ... 500 Hz
Max. interference voltage U_t (change green / red)	240 V
Display	1. red LEDs for voltage $> U_t$ green LED for standby / absence of voltage 2. two-line LCD with backlight for indication of voltage, frequency, type of voltage and battery status 3. acoustic signal $> U_t$
Self-test	Testing function, grounding and protective resistors
Input resistance	311 k Ω
Current peak value	3,2 mA at 1000 V AC/ DC
On-time	15 min
Overvoltage category	CAT IV
Surge voltage strength	$>19,2$ kV case insulation to user >12 kV circuit between test prod and ground
Operating temperature	-15°C ... $+55^{\circ}\text{C}$
Power supply	6 x AA 1,5 V multi-stage battery indicator
Protection category	IP 65, device can be used in moist environments
Design	Two-pole voltage tester with connection to ground by clamp or magnet <ul style="list-style-type: none"> • 4-piece telescope test probe, made of double-walled GRP-tube with moulded resistor decade approx. 186 kΩ • Display part made of impact resistant, dust-proof plastic casing IP 65 with unbreakable display cover • 1,8 m 3 m PUR sheathed cable with clamp or magnet
Standards	Display unit, function and test procedur EN/IEC 61243-3 Extension and telescopic tube in accordance with EN/IEC 61010-1 Surge voltage strength in accordance with EN/IEC 60071
Dimensions / Weight	1650 x 120 x 110 mm run-out length up to 5,1 m device incl. line and magnet 2,3 kg device incl. clamp for rail foot 2,6 kg

Type	Article No.	Earth contact	Telescope	Self-test	LC display for voltage and frequency	For indoor installations	For outdoor installations
TT 1M 50-1000 V	89306	magnet	6 m	■	■	■	■
TT 1K 50-1000 V	89336	rail foot clamp		■	■	■	■

High voltage tester up to 36 kV AC/DC Two-pole



Type overview high voltage tester up to 36 kV

MultiSafe HS 5



- Compact high voltage tester
- Ideal for narrow power stations
- Voltage tester for AC and DC

MultiSafe HS 11

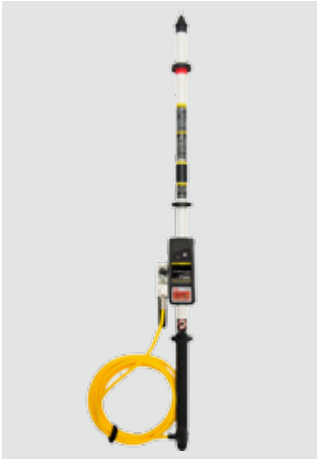


- Universally applicable
- Ideal for all types of switchgears
- Voltage tester for AC and DC

	HS 5	HS 5M	HS 5UK
Nominal voltage range	50 - 5 000 V AC 50 - 7 000 V DC		
Voltage warning LED red / green		■	
LCD-backlighted red / green		■	
360° LED indication red / green			
Voltage indication with value		■	
Acoustic voltage warning		■	
Integrated self-test		■	
Frequency indication		■	
Telescope / max. test height			
For grounded voltages		■	
For ungrounded voltages	■		
Ground connection by		Magnet	Universal clamp
For indoor installations		■	
For outdoor installations			
Power supply	Battery 9V 6LR61		
Article number	89300	89331	89330
Page	40		

	HS 11	HS 11M	HS 11UK
Nominal voltage range	50 - 11 000 V AC 50 - 16 000 V DC		
Voltage warning LED red / green		■	
LCD-backlighted red / green		■	
360° LED indication red / green			
Voltage indication with value		■	
Acoustic voltage warning		■	
Integrated self-test		■	
Frequency indication		■	
Telescope / max. test height			
For grounded voltages		■	
For ungrounded voltages	■		
Ground connection by		Magnet	Universal clamp
For indoor installations		■	
For outdoor installations		■	
Power supply	Battery 9V 6LR61		
Article number	89304	89305	89335
Page	42		

MultiSafe HS 36



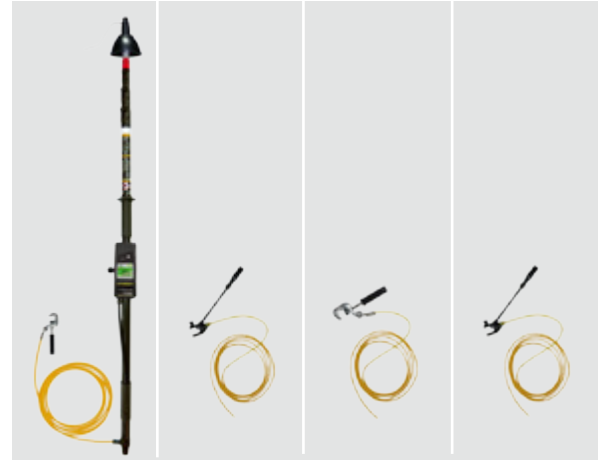
- Wide measuring range
- Large illuminated LCD
- Voltage tester for AC and DC

MultiSafe TT 3



- Telescope system from 1 up to 6 m
- Very versatile
- Voltage tester for AC and DC

MultiSafe TT 36



- Telescope system from 1 up to 6 m / 8 m
- Wide measuring range
- Voltage tester for AC and DC

HS 36
50 - 36 000 V AC 50 - 36 000 V DC
■
■
■
■
■
■
■
■
■
■
■
■
Universal clamp
■
■
Battery 6 x AA 1,5V
89308
44

TT 3M	TT 3K	TT 3UK
50 - 3 000 V AC 50 - 3 000 V DC		
■		
■		
■		
■		
■		
■		
■		
■		
		6 m
■		
■		
Magnet	Clamp	Universal clamp
■		
■		
Battery 6 x AA 1,5V		
89307	89337	89347
46		

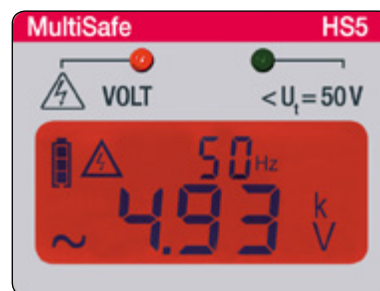
TT 36M	TT 36K	TT 36UK	TT 36K-8m
50 - 36 000 V AC 50 - 36 000 V DC			
■			
■			
■			
■			
■			
■			
		6 m	8 m
■			
■			
Magnet	Clamp	Universal clamp	Clamp
■			
■			
Battery 6 x AA 1,5V			
89329	89309	89351	89310
48			

MultiSafe HS 5

Two-pole high voltage tester up to 5 kV AC / 7 kV DC



Indication of absence of voltage



Colour change of the display at voltage

The MultiSafe HS 5 is a two-pole high voltage tester with LED signals and precise indication of voltage level and frequency.

- Precise indication of voltage up to 5 kV AC / 7 kV DC
- Highest degree of safety provided by moulded protective resistors within the GRP-tube
- Surge voltage strength >100 kV
- Self-test for checking protective resistors and function





Application

The MultiSafe HS 5 is a compact two-pole voltage tester for alternating voltages up to 5 kV and direct voltages up to 7 kV. It is particularly suitable to detect voltage quickly and securely at capacitor banks and links of converters, etc. Voltage level, polarity and frequency are indicated by several systems.

Safety

- Surge voltage strength > 100 kV due to moulded protective resistors
- Integrated self-test to test the protective resistors, function and connection to earth (for HS 5M / HS 5UK)
- Redundant test system with continuous self-monitoring for indicating the absence of voltage

Easy operation

The one-button operation facilitates the application. The result is clearly indicated on the display and by LEDs.

Three display systems

- LEDs red for voltage, green for standby and absence of voltage
- Display for voltage value, frequency as well as voltage type and polarity
- Acoustic signal for voltage > $U_t = 50$ V

Robust design

High-quality elements guarantee function and safety under extreme conditions:

- Impact resistant plastic casing with break-proof display cover
- Twin insulated PUR sheathed cable
- High voltage probes made of glass fibre-reinforced plastic with moulded resistor decade

Types

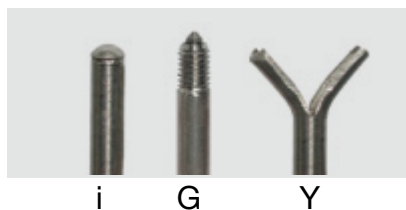


HS 5M with magnet and HS 5UK with universal clamp for fixed connection to ground potential.

Accessories

Accessories are not included in scope of delivery

- Various test electrodes page 72
Standard electrode-i round for busbars and test holes



Bag with shoulder strap



Solid case with aluminum frame

Technical data

Two-pole high voltage tester
MultiSafe HS 5

Nominal voltage range	50 ... 5000 V AC / 7000 V DC
Display range	6 ... 5000 V AC / 7000 V DC
Frequency range	0 ... 1000 Hz
Input resistance	2,7 MΩ
Current peak value	2,6 mA at 7000 V DC
Surge voltage strength	> 100 kV (test report available)
Indicator group	I and III
Max. interference voltage U_t (change green / red)	50 V
Display	<ol style="list-style-type: none"> Red LEDs for voltage > U_t green LED for standby / absence of voltage Two-line LCD with backlight white / red for indication of voltage, frequency, type of voltage and battery status Acoustic signal > U_t
Measurement ranges / Accuracy	50 ... 1000 V DC $\pm 2,5\%$ + 5 Digits 50 ... 1000 V AC $\pm 5\%$ + 10 Digits 1,01 ... 7,00 kV DC $\pm 2,5\%$ + 5 Digits 1,01 ... 5,00 kV AC $\pm 5\%$ + 10 Digits
On-time	15 min, Auto-off-function at absence of voltage
Construction	Only for indoor installations
Operating temperature	- 15°C ... + 55°C
Self-test	Testing function and protective resistors obligatory before indication of measurement results
Power supply	9 V-Block IEC 6LR61 / 6LF22 / 6LP3146 alkalimanganese, multi-stage battery indicator
Design	<ul style="list-style-type: none"> Two-pole voltage tester with two firmly attached high-tension probes made of GRP with moulded resistor decades, approx. 1,35 MΩ each probe Impact resistant, dust-proof plastic casing with unbreakable display cover, protection category IP 65 PUR sheathed cable, twin insulated
Standards	EN/IEC 61243-2 high voltage tester EN/IEC 60071 surge voltage strength further applied standards: EN/IEC 61010 and EN 50110-1 (VDE 0105-1) (further details see risk analysis)
Test label	Date of the next examination on the sticker, repeated inspection at least every 6 years
Dimensions / Weight	550 x 70 x 70 mm / 500 g

Type	Article no.	Integrated self-test	Earth contact	For grounded voltage	For ungrounded voltage	For indoor installations	For outdoor installations
HS 5 50 - 5 000 V AC 50 - 7 000 V DC	89300	■	-	■	■	■	
HS 5M 50 - 5 000 V AC 50 - 7 000 V DC	89331	■	Magnet	■		■	
HS 5UK 50 - 5 000 V AC 50 - 7 000 V DC	89330	■	Universal clamp	■		■	

MultiSafe HS 11

Two-pole high voltage tester up to 11 kV AC / 16 kV DC



Indication of absence of voltage



Colour change of the display at voltage

The MultiSafe HS 11 is a two-pole high voltage tester with LED signals and precise indication of voltage level and frequency.

- Precise indication of voltage up to 11 kV AC / 16 kV DC
- Highest degree of safety provided by moulded protective resistors within the GRP-tube
- Surge voltage strength > 250 kV
- Self-test for checking protective resistors and function

Application

The MultiSafe HS 11 is a compact two-pole voltage tester for alternating voltages up to 11 kV and direct voltages up to 16 kV. It is particularly suitable to detect voltage quickly and securely at capacitor banks and links of converters, etc.

Voltage level, polarity and frequency are indicated by several systems.



Test with HS 11 at 10 kV transformer

Safety

- Surge voltage strength > 250 kV due to moulded protective resistors
- Integrated self-test to test the protective resistors, function and connection to earth (for HS 11M / HS 11UK)
- Redundant test system with continuous self-monitoring for indicating the absence of voltage

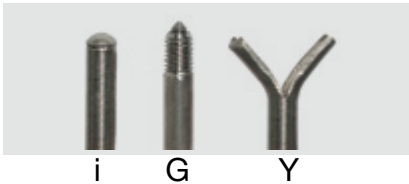
Three display-systems

- LEDs red for voltage, green for standby and absence of voltage
- Display for voltage value, frequency as well as voltage type and polarity
- Acoustic signal for voltage > $U_t = 50$ V

Accessories

Accessories are not included in scope of delivery

- Various test electrodes page 72
Standard electrode-i round for busbars and test holes



Easy operation

The one-button operation facilitates the application. The result is clearly indicated on the display and by LEDs.

Robust design

High-quality elements guarantee function and safety under extreme conditions:

- Impact resistant plastic casing with break-proof display cover
- Dust- and waterproof (IP 65, approved for operation in outdoor areas)
- Twin insulated PUR sheathed cable
- High voltage probes made of glass fibre-reinforced plastic with moulded resistor decade

Types



HS 11M with magnet and HS 11UK with universal clamp for fixed connection to ground potential.



Solid case with aluminum frame



Bag with shoulder strap and ring bolt

Technical data

Two-pole high voltage tester
MultiSafe HS 11

Nominal voltage range	50 ... 11000 V AC / 16000 V DC
Display range	30 ... 11000 V AC / 16000 V DC
Frequency range	0 ... 500 Hz
Input resistance	30 MΩ
Current peak value	0,29 mA at 16000 V DC
Surge voltage strength	> 250 kV (Prüfbericht liegt vor)
Indicator group	I and III
Max. interference voltage U_t (change green / red)	50 V
Display	<ol style="list-style-type: none"> Red LEDs for voltage > U_t green LED for standby / absence of voltage Two-line LCD with backlight white / red for indication of voltage, frequency, type of voltage and battery status Acoustic signal > U_t
Measurement ranges / Accuracy	50 ... 1000 V DC $\pm 2,5\% + 5$ Digits 50 ... 1000 V AC $\pm 5\% + 10$ Digits 1,01 ... 16,00 (16,50) kV DC $\pm 2,5\% + 5$ Digits 1,01 ... 11,00 (12,00) kV AC $\pm 5\% + 10$ Digits
On-time	15 min, Auto-off-function at absence of voltage
Construction	For indoor and outdoor installations IP 65, device can be used in moist environments
Operating temperature	- 15°C ... + 55°C
Self-test	Testing function and protective resistors obligatory before indication of measurement results
Power supply	9 V-Block IEC 6LR61 / 6LF22 / 6LP3146 alkalimanganese, multi-stage battery indicator
Design	<ul style="list-style-type: none"> Two-pole voltage tester with two firmly attached high-tension probes made of GRP with moulded resistor decades, approx. 15 MΩ each probe Impact resistant, dust-proof plastic casing with unbreakable display cover, protection category IP 65 PUR sheathed cable, twin insulated Connection line additionally protected by corrugated tube
Standards	EN/IEC 61243-2 high voltage tester EN/IEC 60071 surge voltage strength further applied standards: EN/IEC 61010 and EN 50110-1 (VDE 0105-1) (further details see risk analysis)
Test label	Date of the next examination on the sticker, repeated inspection at least every 6 years
Dimensions / Weight	1150 x 200 x 60 mm / 1,0 kg Length of test probes 675 mm

Type	Article no.	Integrated self-test	Earth contact	For grounded voltage	For ungrounded voltage	For indoor installations	For outdoor installations
HS 11 50 - 11 000 V AC 50 - 16 000 V DC	89304	■	-	■	■	■	■
HS 11M 50 - 11 000 V AC 50 - 16 000 V DC	89305	■	Magnet	■		■	■
HS 11UK 50 - 11 000 V AC 50 - 16 000 V DC	89335	■	Universal clamp	■		■	■

MultiSafe HS 36

Compact high voltage tester up to 36 kV AC/DC



Compact - light - dismantable



Colour change of the 360 ° LED light strip and the LCD lighting during voltage

With the MultiSafe HS 36, DC and AC voltage up to 36 kV against ground can be tested safely and quickly. In addition to the voltage level, the frequency is displayed on the two-line display.

- Precise indication of voltages up to 36 kV AC / DC and frequency 0 - 200 Hz
- Highest degree of safety provided by moulded protective resistors within the double-walled GRP-tube surge voltage strength > 500 kV
- Dismountable for easy transport

Application

The MultiSafe HS 36 is a two-pole voltage tester for alternating and direct voltages up to 36 kV against ground.



Testing with HS 36 in a 36 kV distribution panel

Design

High-quality elements guarantee function and safety under extreme conditions:

- High voltage probe with moulded resistor decade made of double-walled GRP-tube
- Dust- and waterproof display part made of ABS with unbreakable display cover
- Twin insulated line with large universal clamp for secure grounding
- Modular design with impact resistant, glass fibre-reinforced plastic tube, dismantlable ground line and clamp



Robust and waterproof hard case
(Accessories are not included in the scope of delivery)

Safety

- Surge voltage strength > 500 kV due to moulded protective resistors
- Integrated self-test to test the protective resistors, function and connection to earth
- Redundant test system with continuous self-monitoring for indicating the absence of voltage

Easy operation

The one-button operation simplifies the application. The result is clearly indicated on the display and by LEDs.

Three display-systems

- LEDs red for voltage, green for standby and absence of voltage
- Display for voltage value, frequency as well as voltage type and polarity
- Acoustic signal for voltage > U_t

Accessories

Accessories are not included in scope of delivery

- Different test electrodes page 72
I: Standard electrode round for busbars and test holes



Technical data

Two-pole high voltage tester
MultiSafe HS 36

Nominal voltage range

50 ... 36000 V AC / DC

Display range

40 ... 36000 V AC / DC

Display

- red LEDs for voltage > U_t
green LED for standby / absence of voltage
- two-line LCD with backlight for indication of voltage, frequency, type of voltage and battery status
- acoustic signal > U_t

Indicator group

I and III

Max. interference voltage U_t (change green / red)

1200 V

Measurement ranges / Accuracy

40 ... 1000 V AC/DC $\pm 5\%$ + 10 digits resolution 1 V
1,0 ... 9,9 kV AC/DC $\pm 5\%$ + 10 digits resolution 10 V
10 ... 36 kV AC/DC $\pm 5\%$ + 10 digits resolution 100 V
automatic range switching

Frequency range

0 ... 200 Hz

Input resistance

119 M Ω

Current peak value

< 0,4 mA at 36000 V

On-time

15 min

Self-test

Testing function, grounding and protective resistors

Surge voltage strength

> 500 kV (test report available)

Construction

For indoor and outdoor installations
IP 65, device can be used in moist environments

Operating temperature

- 15°C ... + 55°C

Power supply

6 x AA 1,5 V

Design

- Two-pole voltage tester with fixed connection to ground
- Screwable two-piece high voltage probe, made of doublewalled GRP-tube with moulded resistor decade
- Display part made of impact resistant, dustproof plastic casing IP 65 with unbreakable display cover
- 6 m PUR high voltage cable 40 kV with universal clamp for busbars and fixed ball points up to $\varnothing 25$ mm

Standards

EN/IEC 61243-2 high voltage tester
EN/IEC 60071 surge voltage strength
further applied standards:
EN/IEC 61010 and EN 50110-1 (VDE 0105-1)
(further details see risk analysis)

Test label

Date of the next examination on the sticker, repeated inspection at least every 6 years

Dimensions / Weight

1430 x 100 x 100 mm / 2,1 kg
transportation length: dismantled 900 mm

Type	Article No.	Integrated self-test	Earth contact	For grounded voltage	For ungrounded voltage	For indoor installations	For outdoor installations
HS 36 50 - 36 000 V AC 50 - 36 000 V DC	89308	■	universal clamp	■		■	■

MultiSafe TT 3

Telescope voltage tester for catenary lines up to 3 kV AC/DC



Variable locking for test heights up to 6,2 m



360 ° LED light strip red / green



Colour change of the display at voltage

With the MultiSafe TT 3, voltages up to 3 kV against ground can be tested safely and quickly.

In addition to the voltage level, the frequency is displayed on the two-line display.

- For test heights up to 6,2 m variable height adjustment
- Precise indication of voltages up to 3 kV AC and DC
- Highest degree of safety provided by moulded protective resistor in the GRP-tube, surge voltage strength > 100 kV



Application

The MultiSafe TT 3 is a two-pole high voltage tester for alternating and direct voltages up to 3 kV against ground. It is particularly suitable for quickly and reliably determining the voltages between the overhead line and the rail of railway systems and voltages in switchgears.



Test at overhead line

Design

High-quality elements guarantee function and safety under extreme conditions:

- Telescopic tube with variable height adjustment 6,2 m test height
- Moulded resistor decade made of GRP-tube
- Dust- and waterproof display part made of ABS with unbreakable display cover
- Twin insulated line with universal clamp for secure grounding

Safety

- Surge voltage strength > 100 kV due to moulded protective resistors
- Integrated self-test to test the protective resistors, function and connection to earth
- Redundant test system with continuous self-monitoring for indicating the absence of voltage

Easy operation

The one-button operation facilitates the application. The result is clearly indicated on the display and by LEDs.

Three display-systems

- LEDs red for voltage, green for standby and absence of voltage
- Display for voltage value, frequency as well as voltage type and polarity
- Acoustic signal for voltage > U_t

Accessories

Accessories are not included in scope of delivery

- Bag with ring bolt and shoulder belt
- Wall holder
- Robust case



Bag

Wall holder

Case



Fast self-test for device function and contact between terminal and rail
MultiSafe TT 3K - with rail foot clamp

alternative:



MultiSafe TT 3M - with magnet for rails

Technical data

Two-pole high voltage tester
MultiSafe TT 36

Nominal voltage range	AC / DC 50 ... 3000 V
Display range	40 ... 3000 V AC / DC
Display	1. red LEDs for voltage > U_t green LED for standby / absence of voltage 2. two-line LCD with backlight for indication of voltage, frequency, type of voltage and battery status 3. acoustic signal > U_t
Indicator group	I and III
Max. interference voltage U_t (change green / red)	400 V
Measurement ranges / Accuracy	40 ... 1000 V AC/DC $\pm 5\%$ + 10 digits resolution 1 V 1,00 ... 3,00 kV AC/DC $\pm 5\%$ + 10 digits resolution 10 V
automatic range switching	
Frequency range	0 ... 200 Hz
Input resistance	1664 K Ω
Current peak value	< 1,8 mA at 3000 V
On-time	5 min at maximum nominal voltage
Self-test	Testing function, grounding and protective resistors
Surge voltage strength	> 100 kV (test report available)
Construction	For indoor and outdoor installations IP 65, device can be used in moist environments
Operating temperature	-15°C ... + 55°C
Power supply	6 x AA 1,5 V multi-stage battery indicator
Design	<ul style="list-style-type: none"> • Two-pole voltage tester with connection to ground by clamp or magnet • 4-piece telescope high voltage test probe, made of double-walled GRP-tube with moulded resistor decade approx. 1540 KΩ • Display part made of impact resistant, dustproof plastic casing IP 65 with unbreakable display cover • 1,8 m PUR high voltage cable with clamp or magnet
Standards	EN/IEC 61243-2 high voltage tester EN/IEC 60071 surge voltage strength further applied standards: EN/IEC 61010 and EN 50110-1 (VDE 0105-1) (further details see risk analysis)
Test label	Date of the next examination on the sticker Repeated inspection at least every 6 years
Dimensions / Weight	1740 x 120 x 110 mm run-out length up to 5,2 m test height up to 6,2 m device incl. line and magnet 2,8 kg device incl. clamp for railfoot 3,1kg

Type	Article No.	Earth contact / line	Telescope	Self-test	LC display for voltage and frequency	For indoor installations	For outdoor installations
TT 3M 50-3 000V	89307	Magnet	6 m	■	■	■	■
TT 3K 50-3 000V	89337	Railfoot clamp		■	■	■	■
TT 3UK 50-3 000V	89347	Universal clamp		■	■	■	■

MultiSafe TT 36

Telescope voltage tester for catenary lines up to 36 kV AC/DC



Variable locking
for test heights
up to 6 m or 8 m



Colour change of the display at voltage

With the MultiSafe TT 36, voltages up to 36 kV against ground can be tested safely and quickly. In addition to the voltage level, the frequency is displayed on the two-line display.

- For test heights up to 6,2 m or 8,2 m variable height adjustment
- Precise indication of voltages up to 36 kV AC and DC
- Highest degree of safety provided by moulded protective resistor in the GRP-tube, surge voltage strength > 250 kV



Application

The MultiSafe TT 36 is a two-pole voltage tester for alternating and direct voltages up to 36 kV against ground. It is particularly suitable for quickly and reliably determining the voltages between the overhead line and the rail of railway systems and voltages in switchgears.



Test at a 36 kV compensation system

Three display-systems

- LEDs red for voltage, green for standby and absence of voltage
- Display for voltage value, frequency as well as voltage type and polarity
- Acoustic signal for voltage $> U_t$



Test at a rail overhead line

Design

High-quality elements guarantee function and safety under extreme conditions:

- Telescope tube with variable height adjustment 6,2 m / 8,2 m test height
- Moulded resistor decade made of GRP-tube
- Dust- and waterproof display part made of ABS with unbreakable display cover
- Twin insulated line with universal clamp for secure grounding

Safety

- Surge voltage strength > 250 kV due to moulded protective resistors
- Integrated self-test to test the protective resistors, function and connection to earth
- Redundant test system with continuous self-monitoring for indicating the absence of voltage



MultiSafe TT 36UK

Earthing to grounding cable or fixed ballpoint with universal clamp.

Alternative:

Grounding with magnet or rail foot clamp

Accessories

Accessories are not included in scope of delivery

- Bag with ring bolt and shoulder belt
- Wall holder
- Robust case

Technical data

Two-pole high voltage tester
MultiSafe TT 36

Nominal voltage range

AC / DC 50 ... 36000 V

Display range

40 ... 36000 V AC / DC

Display

1. red LEDs for voltage $> U_t$
green LED for standby / absence of voltage
2. two-line LCD with backlight for indication of voltage, frequency, type of voltage and battery status
3. acoustic signal $> U_t$

Indicator group

I and III

Max. interference voltage U_t (change green / red)

1200 V

Measurement ranges / Accuracy

40 ... 1000 V AC/DC $\pm 5\%$ + 10 digits resolution 1 V
1,00 ... 3,00 kV AC/DC $\pm 5\%$ + 10 digits resolution 10 V
10 ... 36 kV AC/DC $\pm 5\%$ + 10 digits resolution 100 V
automatic range switching

Frequency range

0 ... 200 Hz

Input resistance

52 M Ω

Current peak value

$< 0,9$ mA at 36000 V

On-time

15 min

at maximum nominal voltage

Self-test

Testing function, grounding and protective resistors

Surge voltage strength

> 250 kV (test report available)

Construction

For indoor and outdoor installations
IP 65, device can be used in moist environments

Operating temperature

-15°C ... $+55^{\circ}\text{C}$

Power supply

6 x AA 1,5 V
multi-stage battery indicator

Design

- Two-pole voltage tester with connection to ground by clamp or magnet
- 4-piece telescope high voltage test probe, made of double-walled GRP-tube with moulded resistor decade approx. 52 M Ω
- Display part made of impact resistant, dustproof plastic casing IP 65 with unbreakable display cover
- 1,8 m PUR high voltage cable with clamp or magnet

Standards

EN/IEC 61243-2 high voltage tester
EN/IEC 60071 surge voltage strength
further applied standards:
EN/IEC 61010 and EN 50110-1 (VDE 0105-1)
(further details see risk analysis)

Test label

Date of the next examination on the sticker
Repeated inspection at least every 6 years

Dimensions / Weight

1740 x 120 x 110 mm
run-out length up to 5,2 m / 7,2 m (TT36-8m)
test height up to 6,2 m / 8,2 m (TT36-8m)
device incl. line and magnet 2,8 kg
device incl. clamp for railfoot 3,1kg
TT36K-8m 4,2 kg

Type	Article No.	Earth contact / line	Telescope	Self-test	LC display for voltage and frequency	For indoor installations	For outdoor installations
TT 36M 50-36 000 V	89329	magnet	6 m	■	■	■	■
TT 36K 50-36 000 V	89309	railfoot clamp		■	■	■	■
TT 36UK 50-36 000 V	89351	universal clamp		■	■	■	■
TT 36UK-40L 50-36 000 V	89348	universal clamp	8 m	■	■	■	■
TT 36K-8m 50-36 000 V	89310	railfoot clamp		■	■	■	■
TT 36UK-8m-40L 50-36 000 V	89349	universal clamp		■	■	■	■

Ex-proof measuring and testing devices



Type overview Ex-proof measuring and testing devices

ΩMegaSafe EP 4



- Compact resistance measuring device
- Easy handling
- Versatile accessories

ΩMegaSafe EP 4Ex



- Intrinsically safe resistance meter
- Easy handling
- Battery saving measurement

	EP 4
Voltage measurement range	only warning for external voltage
Resistance measurement range	0,00 Ω - 1999 kΩ
Current measurement range	-
Temperature measurement range	-
Application	Monitoring of protective measures Line and resistance measuring device according to EN / IEC 61557-4
Ex approval	
Ex application group	-
Ex intrinsically safe in accordance with	-
Gas group	-
Temperature class	-
Power supply	Battery 9 V 6LR61
Article number	83302
Page	54

	EP 4Ex
Voltage measurement range	only warning for external voltage
Resistance measurement range	0,00 Ω - 1999 kΩ
Current measurement range	-
Temperature measurement range	-
Application	Monitoring of protective measures Line and resistance measuring device according to EN / IEC 61557-4
Ex approval	■
Ex application group	II 2G (chemistry)
Ex intrinsically safe in accordance with	ib
Gas group	IIC
Temperature class	T4
Power supply	Battery 9 V 6LR61 Duracell
Article number	83301
Page	54

ΩMegaSafe ISO 1Ex



- Intrinsically safe insulation tester
- Direct measuring in Ex-areas without interrupting production processes

VarioSafe EXM 25



- Intrinsically safe multimeter up to 1000 V
- Automatic measuring range selection
- Versatile accessories

EX-accessories



- Intrinsically safe clamp-on ammeter
- Intrinsically safe temperature measurement accessory

ISO 1Ex
only warning for external voltage
0 kΩ - 1999 GΩ
-
-
Monitoring of protective measures
High-impedance megohmmeter and insulation tester according to EN / IEC 61557-2
■
II 2G (chemistry) I M2 (mining)
ib
IIB
T4
Battery 9 V 6LR61 Duracell
83310
56

EXM 25
0 - 1000 V
0,0 Ω - 19,99 MΩ
0 mA - 2,00 A
only with TMZ - accessories
Intrinsically safe multimeter
■
II 2G (chemistry) I M2 (mining)
ib
IIB (up to 1000 V) IIC (up to 690V)
T6
Intrinsically safe Lithium battery Tietzsch
82026
60

MZ 1005	TMZ
-	-
-	-
0,0 A - 1000 A	-
-	- 80 - +600 °C
Intrinsically safe clamp-on ammeter	Intrinsically safe Temperature measurement accessory
■	■
I M2 (mining)	II 2G (chemistry) I M2 (mining)
ib	ib
I Mb	IIC
T4	T6
Battery 9 V 6LR61 Duracell	-
82319	82318
62	

ΩMegaSafe EP 4 / EP 4Ex

Compact earth resistance tester for safe areas & hazardous Ex-areas



also



Test lines in accordance with
EN-61010-031 CAT III
Cap removable for CAT II environments

NEW

Faster and more
energy-efficient

The ΩMegaSafe EP 4 is a manageable resistance measuring device for fast testing according to EN/IEC 61557-4 of protective and grounding lines, equipotential bonding lines and lines at lightning arrester.

- Safe and universal between 10 mΩ and 2 MΩ
- High measurement current 0,2 A for Lo-Ω-range up to 10 Ω
- Fast compensation of measuring line per keypress
- Automatic pole change and storage of measurement results



Low resistive line tests

Easy testing of resistances in protective lines and grounding systems, equipotential bonding lines, shielding etc. in accordance with EN 61557-4 (VDE 0413-4).

Universal and safe

Measurements between 10 mΩ and 2 MΩ with extreme safety against external voltage

- Lo-Ω-measurement range up to 10 Ω with high measurement current 0,2 A
- Further measurement ranges up to 2000 kΩ
- Usable in mains up to 400 V
- Acoustic and optic warning in case of external voltage, flashing indication of voltage value
- Robust, manageable casing with attached test prod for heavy demands, IP 65

EP 4 for reliable and fast low resistive tests

Easy handling

- Zero balance (compensation) of measuring line per keypress
- Supports several measuring lines with an impedance up to 3,5 Ω (approximately 200 m) for quick results
- Automatic pole change and storage of measurement results (can be switched off)



Quick compensation of the measuring line



Three display systems

Unambiguous and rapid recognition of function, result and danger:

- Bright LED for external voltage, polarity- and Lo-Ω-measurement with 0,2 A
- Clear display for measurement result and function with backlight
- Acoustic warning signal

Accessories

Test lines 73009 and battery are included in the delivery of the EP 4 (standard version) or EP 4Ex (Ex-proof version).



Accessories are not included in scope of delivery

- 50 m measuring line on decoiler with standard socket, not for Ex-areas
- 50 m measuring line on wire reel
- Contact clamp with standard socket
- Leather bags
- Sawtooth test prod for rusty and varnished test sites



Test prod for rusty and varnished test sites

Technical data

Line and resistance measuring device EP 4 / EP 4Ex according to EN/IEC 61010-1 and EN/IEC 61557-4 (VDE 0413 part 4)
Ex-proof version EP 4Ex additionally according to DIN EN 60079-0 and 60079-11

EC type examination certificate (EP 4Ex)

II 2 G Ex ib IIC T4 ATEX 552826

Measurement ranges

10 Ω (Lo-Ω)	resolution	0,01 Ω
100, 2000 Ω	resolution	0,1 ... 1 Ω
20, 200, 2000 kΩ	resolution	0,01 ... 1 kΩ

Accuracy

1,5 % + / - 4 digit at 20°C

Measurement current

10 Ω (Lo-Ω)-range:	200 mA
100 Ω-range:	20 mA
further ranges:	1 μA ... 20 mA

Open-circuit voltage

> 4 V

Measuring line balance

Automatic 0-balance (CAL) up to 3,5 Ω

Digital indication

2-line LCD-display, 3 ½ digit, overflow indication via OL backlight

Voltage indication

Red LED and acoustic warning signal as well as indication of the value in Volt

Overvoltage protection

Up to 400 V reversible via semiconductor and via special fuse

Overvoltage category

CAT III 300 V / CAT II 600 V according to EN/IEC 61010-1

Operating temperature

-10°C ... + 50°C

Power supply

Battery 9 V-Block AIMn
EP 4: 9 V-Block IEC 6LR61 / 6LF22 / 6LP3146 (alkaline-manganese) any manufacturer
EP 4Ex: only DAIMON MN1604, 6LR61 (yellow) or Duracell MN 1604, 6LF22 Plus Power Duralock (black /yellow) multi-stage battery indicator automatic switch-off

Casing

Made of impact resistant ABS with unbreakable display cover

Protection category

IP 65, device can be used in moist environments

Dimensions / Weight

60 x 230 x 40 mm
EP 4: 180 g
EP 4Ex: 220 g

Type	Article no.	Continuity measurement	Automatic pole change	Voltage warning	Ex-proofed
EP 4	83302	■	■	■	
EP 4Ex	83301	■	■	■	■

ΩMegaSafe ISO 1 / ISO 1Ex

Compact megohmmeter for safe areas & hazardous Ex-areas



ISO 1Ex with two test leads for the fixed connection

ISO 1 with adjustable probe tip

The ΩMegaSafe ISO 1Ex is a compact high-impedance testing device for insulating resistances and bleeder resistors in potentially explosive atmospheres.

- Safe and universal between 1 k Ω and 2 T Ω
- Test voltage
100, 250, 500, 1000 V for ISO 1
32, 100, 500 V for ISO 1Ex
- Indication of external voltage and integrated voltage indication up to 500 V
- Push button for rapid discharge of capacities



Easy insulation tests

In Ex-areas with EN 61557-2 (VDE 0413-2), connectible bleeder test in accordance with EN 61340.

Universal and safe

Measurements between 10 kΩ and 2 GΩ / 2 TΩ with extreme safety against sparking

- Robust, manageable casing with fixed test prod, IP 65
- 7 measurement ranges with automatic range selection
- Acoustic and optic warning in case of external voltage, flashing indication at voltages 32 V
- Push button for rapid discharge of capacities

Reliable and fast

Easy handling:

- Test voltage selection per push button
- Simultaneous indication of test voltage and resistance value on the two-line display
- Warning against voltages > 32 V and rapid discharge of capacities per push button
- Fast measurements in GΩ ranges, measurement option TΩ switchable (3 additional measurement ranges)



Three readout systems

Unambiguous and rapid recognition of function, result and danger:

1. LED for external voltage, active testing and selected test voltage
2. Display for test voltage and measurement value with backlight
3. Acoustic warning signal

Accessories

- one test line 84311 600 V CAT III 80 cm with crocodile clip and battery included in scope of delivery (ISO 1)
- two test lines 84311 / 84314 600 V CAT III red and black 80 cm with crocodile clips and battery included in scope of delivery (ISO 1Ex)
- further accessories are not included
- Leather bags
- Attachable test probe

Special accessories for measurements up to 2 TΩ:

Special measuring lines and electrodes are required for measurements at bleeder and surface resistances

- ISO-TΩ measuring line
- Annular electrode in accordance with EN 61340-5-1 and EN 61340-2-3 for measurements of surface resistance and volume resistivity, weight: 0,515 kg
- Electrode in accordance with EN 61340-4-1 and EN 61340-2-3 for measurements of surface and bleeder resistance, weight: 2,27 kg



Check the conductivity of ESD floors



Attachable test probe CAT III (not suitable for Ex-application)

Technical data

High-impedance megohmmeter
ΩMegaSafe ISO 1 / ISO 1Ex
according to EN/IEC 61010-1 and EN/IEC 61557-2 (VDE 0413 part 2)
Ex-proof version in accordance with EN 60079-0 and EN 60079-11

EC type examination certificate (ISO 1Ex)

Ex II 2 G Ex ib IIBT4 BVS 06 ATEX E130
Ex I M2 (M1) EX ib [ia] I BVS 06 ATEX E130

Measurement ranges

1,999 MΩ	resolution	1 kΩ	5% +/- 5D
19,99 MΩ	resolution	10 kΩ	5% +/- 5D
199,9 MΩ	resolution	100 kΩ	5% +/- 5D
1,999 GΩ	resolution	1 MΩ	5% +/- 5D
19,99 GΩ	resolution	10 MΩ	10% +/- 5D

with selected measurement option TΩ (only ISO 1Ex):

199,9 GΩ	resolution	100 MΩ	10% +/- 5D
1999 GΩ	resolution	1 GΩ	25% +/- 5D

Accuracy

5% +/- 5 Digit bei 20°C

Test voltage/measurement current (ISO 1)

100 V	1 mA	+/-20 %
250 V	1 mA	+/-20 %
500 V	1 mA	+/-20 %
1000 V	1 mA	+/-20 %

Test voltage/measurement current (ISO 1Ex)

32 V	64 μA	+/-20 %
100 V	200 μA	+/-20 %
500 V	1 mA	+/-20 %

Discharge push-button

For rapid discharge of capacities

Digital indication

2-line LCD-display, 3 1/2 digit, overflow indication via OL backlight

Voltage indication

Red LED and acoustic warning signal as well as indication of the value in Volt
24 - 400 V AC
15 - 500 V DC

Overvoltage category

CAT IV 600 V
according to EN/IEC 61010-1

Operating temperature

-10°C ... + 50°C

Power supply

Battery 9 V-block AIMn
Daimon MN 1604; 6LR61 or Duracell MN 1604 Plus Duralock 6LF22
multi-stage battery indicator
automatic switch-off

Casing

Made of impact resistant ABS with unbreakable display cover, antistatic coated

Protection category

IP 65, device can be used in moist environments

Dimensions / Weight

60 x 230 x 40 mm / 220 g

Type	Article no.	Insulation test	Testing of leakage resistors	Voltage warning	Ex-proofed
ISO 1	83315	■	■	■	
ISO 1Ex	83310	■	■	■	■

Accessories Ω MegaSafe EP 4 / ISO 1Ex

The Ω MegaSafe EP 4 and ISO 1Ex can be customized with accessories for different measurement tasks. Long cables extend the test area, special test probes and electrodes facilitate the work.

Test lines



For a wide range of applications, measuring cables with a length up to 200 m can be used.



73009
Test line with removable protection cap for CAT IV environments



73004
Decoiler with 50 m measuring line

Test probes and clamps



Probes for painted surfaces and clamps for connection to ground potential facilitate the work.



The electrode protection of the EP must be removed before using test probes.



73007
Sawtooth test prod



73001
Earth clamp



73008
Attachable test probe for ISO 1Ex

Electrodes



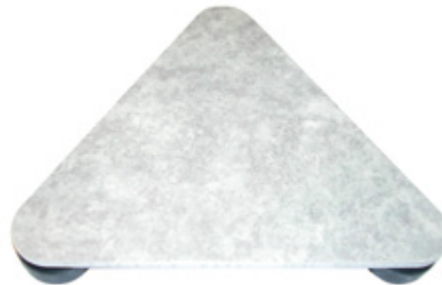
For testing antistatic floors and surfaces, we offer you a selection of standard test probes for the ISO 1Ex.



73011
Annular electrode



73012
Electrode for surface
resistance



73013 Tripod electrode for floors

Bags and storage



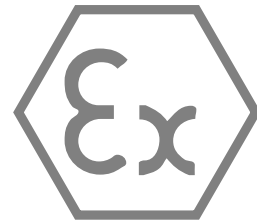
Various bags and containers facilitate the transport and protect the EP 4 / EP 4Ex, ISO 1 / ISO 1Ex and accessories.

Overview of the bags on page 77



VarioSafe EXM 25

Multimeter for mining and chemical industries



The VarioSafe EXM 25 is an intrinsically safe multimeter for potentially explosive atmospheres.

- Universal for resistance, current, frequency, temperature and voltage up to 2000 V
- For intrinsically safe and not intrinsically safe circuits up to 2000 V according to ATEX directive 94/9 EG
- Highest degree of safety provided by moulded protective resistors in DATA-HOLD test prods CAT IV, 1000 V
- Intrinsically safe source of energy NiMH-accu or Li-battery
- Robust casing made of antistatic plastic



Universal and variable

- 5 integrated measurement functions
- Illuminated two-line display for voltage, resistance, current, frequency and temperature with test attachment
- Power supply either from battery or accu
- Multifunctional accessories

Safe

Voltage tester functions

- Moulded resistors directly behind the test prods guarantee an absolutely safe voltage testing - **CAT IV 1000 V**
- Approved for **intrinsically safe** and **not intrinsically safe** circuits up to **2000 V** (1000 V standard / 2000 V with measuring tips SPA-HS2, optional)
- Distinctive by separate test prods for voltage or resistance
- Voltage test prods lockable by bayonet fastenings additional LED signal for voltage
- Moulded safety barrier protects against voltage up to 1000 V during resistance measurements
- Integrated control of current range up to 1000 V

Easy operation

Automatic function and integrated safety against operating errors

- Automatic selection of measurement range
- Indication of type of voltage + - ~
- Red LED signalises voltage, green LED indicates continuity
- DATA-HOLD push button within the measuring tip saves the displayed value
- Self-test and automatic battery check
- Automatic switch-off after 60 sec when no measurements are taken

Robust casing

For decades approved in mining

- Special casing made of impact resistant antistatic plastic and unbreakable display cover
- Universal jack with bayonet fastening for DATA-HOLD test prods and further accessories
- Standard sockets for resistance and current
- LEDs for voltage and resistance



Standard accessories

DATA-HOLD test prods for voltage and frequency up to 1 kV and standard prods for resistance/current, as well as an intrinsically safe energy source, accu or battery are included in the scope of delivery.

Accessories / spare parts

The following accessories are not included in scope of delivery

- Ever-ready bag
- Plug-in power supply
- NiMH accu intrinsically safe T4
- Lithium-battery intrinsically safe T6
- Temperature measurement accessory, intrinsically safe, -80°C up to +600°C
- Universal sensor Fe-CuNi
- Surface sensor Fe-CuNi
- High voltage probes up to 2000 Volt (Ex I)
- Clamp-on ammeter for AC/DC up to 1000 A (for Ex I only)

Technical data

Intrinsically safe multimeter VarioSafe EXM 25 tested and certified in accordance with EN 60079-0 and EN 60079-11

EC type examination certificate

DMT 03 ATEX E 013

Ex II 2G Ex ib T4/T6 Gb and Ex I M2 Ex ib I Mb

Nominal measurement ranges

usable in electricity networks group
Ex I bis 1(2) kV, Ex IIB and Ex IIC up to 690 V

Direct voltage 1 kV (2 kV – request information)

Red LED from 12 V, LCD 3 1/2-digit:
1, 10, 100, 1000 V (1610 V), ± 1,5% + 3 digit
resolution 0.001 ... 1 V

Alternating voltage 1 kV (2 kV – request information)

Red LED from 12 V, LCD 3 1/2-digit, TRMS;
10, 100, 1000 V (1160 V) resolution 0,01 ... 1 V
±1,5% + 3 digit at 0 ... 100 Hz
±5% + 5 digit at 101 ... 500 Hz

Input resistance

2 MΩ distributed to 4 resistances,
moulded into DATA-HOLD test prods

Continuity/resistance

Green LED LCD 3 1/2-digit
200, 2000 Ω
20, 200, 2000 kΩ, 2 MΩ, 20 MΩ ± 1 % + 5 digit,
resolution 0,1Ω ... 10 kΩ

Current

AC/DC 1000 mA, 2 A ± 1 % + 2 digit
resolution 1 ... 10 mA

Current with clamp

AC/DC 100, 1000 A, ± 1,5 % + 2/3 digit
resolution 0,1 ... 1 A

Frequency

200, 2000 Hz ± 1 % + 2 digit, resolution 0,1 ... 1 Hz
10 kHz ± 3 % + 2 digit, resolution 0,01 kHz

Temperature with measurement accessory

-80°C... +150°C ± 1,5 % + 3 digit, resolution 0,1°C
-80°C... +600°C ± 1,5 % + 2 digit, resolution 1°C

Further functions

Automatic selection of measurement range,
indication of function, self-test, automatic switch-off

Power supply

Intrinsically safe energy source, exchangeable
Li-battery (T6) or NiMH accu (T4)
exchange in Ex-areas admitted

Operating temperature

- 10°C ... + 40°C

Casing

PA impact resistant, antistatic,
LCD cover PC unbreakable

Protection category

IP 54, device can be used in moist environments

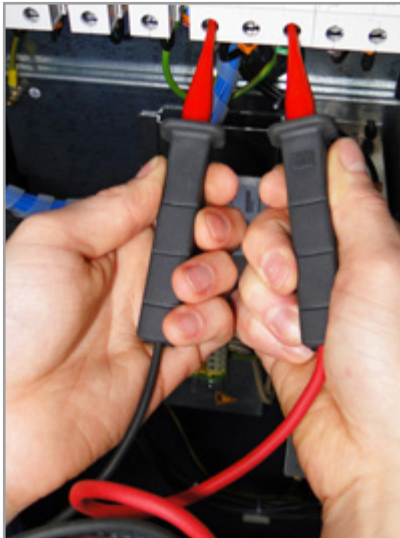
Dimensions / Weight

85 x 180 x 38 mm / 335 g

Accessories VarioSafe EXM

Application area of the VarioSafe EXM can be extended by accessories. These accessories are designed for use in Ex-areas.

Measuring lines



Different measuring lines for different voltages extend the application of the EXM.



72010
Voltage test prods
up to 1000 V AC / DC



72011
Voltage test prods
up to 2000 V AC / DC



82010
Test lead for resistance
and current

Batteries and accumulators



The special accus and Lithium batteries guarantee maximum safety in Ex-areas.



72025
EXM accu NiMH



72026
EXM Lithium-battery

Accessories



With these accessories the application of the VarioSafe EXM 25 is extended.



82319
Clamp-on ammeter



72328 Plug-in power supply for charging EXM accu



82318
Temperature measurement accessory

Bag















The practical leather carrying case facilitates the use of the EXM 25.



82011
Leather ever-ready bag













Article list

Voltage tester up to 1000 V
















	Art. No.	Type	Description		phase tester single-pole	phase sequence indication	adjustable electrode length	acoustic voltage indication	additional load	works without battery
Prüfball SPB	81411	SPB 500B	Prüfball analog 20...500 V phase / phase sequence indication, continuity and self-test, CAT IV 500 V without additional load		■	■				■
	81401	SPB 500PR	Prüfball Analog 20...500 V phase / phase sequence indication, continuity and self-test, CAT IV 500 V with additional load and vibration indication		■	■			■	■
	81402	SPB 500PRA	Prüfball Analog 20...500 V phase / phase sequence indication, continuity and self-test, CAT IV 500 V with additional load and acoustic signal		■	■		■	■	■
	81414	SPB 1000B	Prüfball analog 20...1000 V phase / phase sequence indication, continuity and self-test, CAT IV 1000 V without additional load		■	■				■
	81404	SPB 1000PR	Prüfball analog 20...1000 V phase / phase sequence indication, continuity and self-test, CAT IV 1000 V with additional load and vibration indication		■	■			■	■
	81422	SPB 500L	Prüfball digital 50...500 V phase / phase sequence indication, continuity and self-test, CAT IV 500 V with additional load		■	■			■	□
	81423	SPB 1000L	Prüfball digital 50...1000 V phase / phase sequence indication, continuity and self-test, CAT IV 1000 V with additional load		■	■			■	□
				315 x 105 x 60 mm; 0,470 kg						
Electricity meter tester ZAP	81314	ZAP 350	Electricity meter tester analog 20...500 V phase / phase sequence indication, continuity and self-test 350 W additional load, CAT IV 300 V 300 x 200 x 50 mm; 0,610 kg		■	■			350 W	■
	81315	ZAP 350L	Electricity meter tester digital 50...500 V phase / phase sequence indication, continuity and self-test 350 W additional load, CAT IV 500 V 300 x 200 x 50 mm; 0,635 kg		■	■			350 W	□
	81316	ZAP 1050L	Electricity meter tester digital 50...500 V phase / phase sequence indication, continuity and self-test 1050 W additional load, CAT IV 500 V 400 x 175 x 75 mm; 0,950 kg		■	■			1050 W	□
Floodwater SPB	81317	SPB 500L-HW	Prüfball digital for flooded cellar rooms with 30 m line and clamp on reel 50...500 V, integrated self-test incl. extension SPB-HW-600-i and plastic casing 400 x 400 x 180 mm; 2,460 kg		■					□
	81417	SET SPB-HW	Floodwater-SET consisting of: Prüfball SPB 500L-HW Screw clamp SPB-HW-KLE Cloth bag SPB-HW-BAG 640 x 290 x 250 mm; 4,320 kg		■					□

□ Maintenance-free thanks to integrated Longlife battery for additional functions










Voltage tester up to 1000 V

	Art. No.	Type	Description		phase tester single-pole	phase sequence indication	adjustable electrode length	acoustic voltage indication	additional load	works without battery
SPB subway / trams	81391	SPB 1000L-UB	Prüfball digital 50...1000 V optimized for tests on subways / trams , self-test with green LED for dark environments with phase test, with additional load CAT IV 1000 V 315 x 105 x 60 mm; 0,470 kg		■				■	□
	81390	SET SPB-UB	U-Bahn-SET consisting of: Prüfball SPB 1000L-UB magnet SPB-S-MAG extension SPB-S-250-L 440 x 175 x 75 mm; 0,635 kg		■				■	□
MultiSafe DSP	84402	DSP 4	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test CAT IV 600 V / CAT III 1000 V		■	■				
	84403	DSP 4F	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with phase sequence without ground potential (IT power grids), CAT IV 600 V / CAT III 1000 V		■	■				
	84405	DSP 4ST	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with adjustable electrode length CAT IV 600 V / CAT III 1000 V		■	■	■			
	84406	DSP 4FST	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with IT phase sequence test and adjustable electrode, CAT IV 600 V / CAT III 1000 V		■	■	■			
	84404	DSP 4UL	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with CSA / UL-certification a. adjustable electrode CAT IV 600 V / CAT III 1000 V 300 x 100 x 50 mm; 0,360 kg		■	■	■			
	84502	DSP 5B	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with phase sequence without ground potential (IT power grids), CAT IV 1000 V		■	■				
	84501	DSP 5	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with IT-phase sequence test with additional load CAT IV 1000 V		■	■			■	
84503	DSP 5ST	MultiSafe DSP 0... 1200 V / 1500 V DC phase / phase sequence / continuity / self-test with IT-phase sequence test with additional load and adjustable electrode CAT IV 1000 V 315 x 105 x 60 mm; 0,425 kg		■	■	■		■		
ProfiSafe LSP	85421	LSP 4B	ProfiSafe LSP 12...690 V LCD-7 step bargraph phase / phase sequence / continuity / self-test CAT IV 600 V / CAT III 690 V		■	■			■	
	85422	LSP 4L	ProfiSafe LSP 12...690 V LCD-value indication phase / phase sequence / continuity / self-test CAT IV 600 V / CAT III 690 V 260 x 75 x 75 mm; 0,230 kg		■	■			■	











Accessories voltage tester up to 1000 V

	Art. No.	Type	Description		SPB all types	ZAP all types	DSP 4 / DSP 4F / DSP 5	DSP 4ST / DSP 4UL / DSP 5ST	DSP thread set required	LSP 4B / LSP 4L
Extensions	81020	SPB-S500-Y*	Extension 500 mm insulated stainless steel tube, 1000 V 510 x 20 x 20 mm; 0,070 kg		■	■				
	81022	SPB-S600-Y*	Extension 600 mm insulated stainless steel tube, 1000 V 610 x 20 x 20 mm; 0,080 kg		■	■				
	81028	SPB-S900-Y*	Extension 900 mm light GRP-tube, 1000 V 810 x 20 x 20 mm; 0,105 kg		■	■				
	84313	LSP-S500-Y*	Extension 500 mm attachable insulated stainless steel tube, 1000 V 502 x 20 x 20 mm; 0,075 kg				■			■
	84010	DSP-S500-Y*	Extension 500 mm screwable insulated stainless steel tube, 1000 V 550 x 30 x 30 mm; 0,090 kg				■	■	■	
	84014	DSP-S940-Y*	Extension 900 mm screwable light GRP-tube, 1000 V 860 x 30 x 30 mm; 0,090 kg				■	■	■	
	81031	S-HUELSE	Plastic sleeve for storage of extensions up to 600 mm Suitable for a pair of extensions 350 x 45 x 45 mm; 0,070 kg		■	■	■	■	■	■
			  <p>* Please select the electrode shape when ordering - Electrode Y for overhead lines (standard) - Electrode i for busbars and measuring points</p>							
Insertion prod	81021	SPB-S20-A	Insertion prod 20 mm screwable for tests on underground cables, 1000 V 90 x 20 x 20 mm; 0,015 kg		■	■				
	84321	DSP-S20-A	Insertion prod 20 mm screwable for tests on underground cables, 1000 V 140 x 30 x 30 mm; 0,040 kg				■	■	■	
Pin prod	81023	SPB-S70	Flexible pin prod 3 x 63 mm screwable for narrow test points CAT IV 600 V / CAT III 1000 V 145 x 20 x 20 mm; 0,015 kg		■	■				
	84013	DSP-S70	Flexible pin prod 3 x 58 mm attachable for narrow test points CAT IV 600 V / CAT III 1000 V 145 x 20 x 20 mm; 0,015 kg				■			■
	84315	DSP-S66	Flexible pin prod 3 x 63 mm screwable for narrow test points CAT IV 600 V / CAT III 1000 V 180 x 30 x 30 mm; 0,040 kg				■	■	■	
	84318	DSP-S120	Flexible pin prod 3 x 110 mm screwable for narrow test points CAT IV 600 V / CAT III 1000 V 235 x 30 x 30 mm; 0,040 kg				■	■	■	







Accessories voltage tester up to 1000 V

	Art. No.	Type	Description		SPB all types	ZAP all types	DSP 4 / DSP 4F / DSP 5	DSP 4ST / DSP 4UL / DSP 5ST	DSP thread set required	LSP 4B / LSP 4L
Adapter	81029	SPB-S-ADA	Screwable adapter with 4 mm socket suitable for the connection of test leads CAT IV 600 V / CAT III 1000 V 70 x 20 x 20 mm; 0,015 kg		■	■				
	84011	DSP-S-ADA	Attachable adapter with 4 mm socket suitable for the connection of test leads CAT IV 600 V / CAT III 1000 V 70 x 20 x 20 mm; 0,015 kg				■			■
	84312	DSP-S-ADAS	Screwable adapter with 4 mm socket suitable for the connection of test leads CAT IV 600 V / CAT III 1000 V 120 x 30 x 30 mm; 0,035 kg				■	■	■	
DSP thread set	84019	DSP -G4	Thread set including glue for DSP 4 / DSP 4F Required for the use of screw-on extensions and adapters 170 x 100 x 30 mm; 0,020 kg							
	84023	DSP ST-G4	Thread set including glue for DSP 4ST / DSP 4FST / DSP 4UL Required for the use of screw-on extensions and adapters 170 x 100 x 30 mm; 0,020 kg							
	84024	DSP -G5	Thread set including glue for DSP 5 / DSP 5B / DSP 5ST Required for the use of screw-on extensions and adapters 170 x 100 x 30 mm; 0,020 kg							
Test lines	84311	L-SETR	Test line with two 4 mm sockets, red including crocodile clip CAT IV 600 V / CAT III 1000 V 170 x 100 x 30 mm; 0,060 kg		■	■	■	■		■
	84314	L-SETS	Test line with two 4 mm sockets, black including crocodile clip CAT IV 600 V / CAT III 1000 V 170 x 100 x 30 mm; 0,060 kg		■	■	■	■		■
Testbox	81041	SP 200	Manageable voltage source testbox for enhanced self-test generates 50 - 690 V test voltage incl. 6 AA batteries, Not suitable for testing with screwed-on extension probes. 170 x 75 x 75 mm; 0,380 kg		■	■	■	■		■









Accessories voltage tester up to 1000 V

Bags	Art. No.	Type	Description		SPB all types	ZAP all types	DSP 4 / DSP 4F / DSP 5	DSP 4ST / DSP 4UL / DSP 5ST	DSP thread set required	LSP 4B / LSP 4L
	81032	SP-KLT	Artificial leather bag for SPB / DSP with hand strap 300 x 130 x 60 mm; 0,475 kg		■		■	■		
	81030	SP-LED	Leather bag, for SPB / DSP with hand strap and shoulder strap 300 x 130 x 60 mm; 0,475 kg		■		■	■		
	84020	DSP-ETU	Artificial leather case for DSP / LSP 310 x 120 x 30 mm; 0,125 kg				■	■		■
	84021	DSP-COR	Cloth bag Cordura for DSP with belt loop 310 x 160 x 15 mm; 0,075 kg				■	■		
	85320	LSP-COR	Cloth bag Cordura for LSP with belt loop 295 x 135 x 15 mm; 0,070 kg							■
	81035	SP-KLT-S600	Artificial leather bag for SPB / DSP / LSP and extensions up to 600 mm with shoulder strap 650 x 175 x 50 mm; 0,225 kg		■	■	■	■		■
	81033	Z350-LED	Leather bag for ZAP 350 / SPB-UB with shoulder strap 300 x 210 x 55 mm; 0,560 kg			■				
	81034	Z350-KLT	Artificial leather bag for ZAP 350 / SPB-UB 300 x 210 x 55 mm; 0,560 kg			■				
	81037	Z1050-LED	Artificial leather bag for ZAP 1050L 350 x 210 x 60 mm; 0,640 kg			■				
81039	SPB-HW-BAG	Cloth bag for SPB-HW and accessories 670 x 300 x 30 mm; 1,000 kg								












Accessories voltage tester up to 1000 V

	Art. No.	Type	Description		SPB all types	ZAP all types	DSP 4 / DSP 4F / DSP 5	DSP 4ST / DSP 4UL / DSP 5ST	DSP thread set required	LSP 4B / LSP 4L
Accessories SPB-HW	81045	SPB-HW-S600-i	Extension 600 mm insulated stainless steel tube, electrode i 610 x 20 x 20 mm; 0,080 kg							
	64224	SPB-HW-SPI	Earthing spike, 600 mm for SPB-HW 610 x 100 x 40 mm; 1,600 kg							
	64215	SPB-HW-KLE	Screw clamp for earthing on masts for SPB-HW 250 x 130 x 30 mm; 0,740 kg							
SPB-HW Floodwater demo box	64225	SPB-HW-DEMO	Demo set for SPB 500L-HW consisting of: Box for water, two test electrodes with RCD-secured connection line SPB 500L-HW is not included in the demo set ca. 300 x 500 x 300 mm; 2,000 kg							
SPB-UB Accessories	81090	SPB-S-MAG	Magnet for SPB test electrode for simple contacting of rails 180 x 110 x 40 mm; 0,125 kg		■	■				
	81091	SPB-S-250-L	Extension 250 mm L-shape insulated stainless steel tube, 1000 V 260 x 60 x 20 mm; 0,040 kg		■	■				










High voltage tester up to 36 kV

	Art. No.	Type	Description		integrated self-test	connection to earth	bi-color LCD / LED red / green	for indoor use	for outdoor use	telescope-system
MultiSafe HS 5	89300	HS 5	High voltage tester with two test probes 6...5000 V AC / 7000 V DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 600 x 215 x 85 mm; 1,020 kg		■		■	■		
	89331	HS 5M	High voltage tester with magnet and 3 m connection line for one-sided earth connection 6...5000 V AC / 7000 V DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 600 x 215 x 85 mm; 0,740 kg		■	magnet	■	■		
	89330	HS 5UK	High voltage tester with universal clamp and 3 m connection line for one-sided earth conne. 6...5000 V AC / 7000 V DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 600 x 215 x 85 mm; 1,400 kg		■	universal clamp	■	■		
MultiSafe OSHS 5	89400	OSHS5-i	Two-pole high voltage measuring adapter for oscilloscopes , ratio 1:500 / 1:1000 up to 5000 V AC / 7000 V DC with fixed earth connection Suitable for standard oscilloscope with 1Mohm input resistance. 600 x 215 x 85 mm; 1,160 kg			clamp		■		
MultiSafe HS 11	89304	HS 11	High voltage tester with two test probes 50...11 000 V AC / 16 000 V DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 1180 x 220 x 90 mm; 1,860 kg		■		■	■	■	
	89305	HS 11M	High voltage tester with magnet and 3 m connection line for one-sided earth connection 50...11 000 V AC / 16 000 V DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 1180 x 220 x 90 mm; 1,660 kg		■	magnet	■	■	■	
	89335	HS 11UK	High voltage tester with universal clamp and 3 m connection line for one-sided earth conne. 50...11 000 V AC / 16 000 V DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 1180 x 220 x 90 mm; 2,340 kg		■	universal clamp	■	■	■	
MultiSafe HS 36	89308	HS 36	High voltage tester with universal clamp and 6 m connection line for one-sided earth connection, demountable for transport 50...36 000 V AC / DC with LCD, self-test, frequency indication electrode i, test electrodes interchangeable optional additional electrodes 1200 x 320 x 170 mm; 5,200 kg		■	universal clamp	■	■	■	














Telescope voltage testers

	Art. No.	Type	Description		integrated self-test	connection to earth	bi-color LCD / LED red / green	for indoor use	for outdoor use	telescope-system
MultiSafe TT 1	89306	TT 1M	Telescope voltage tester with magnet and 3 m connection line for one-sided earth connection 50...1000 V AC / 1500 V DC test height variable up to 6,2 m 1640 x 120 x 110 mm; 2,800 kg		■	magnet	■	■	■	■
	89336	TT 1K	Telescope voltage tester with clamp and 3 m connection line for one-sided earth connection 50...1000 V AC / 1500 V DC test height variable up to 6,2 m 1640 x 120 x 110 mm; 3,100 kg		■	clamp f. railfoot	■	■	■	■
MultiSafe TT 3	89307	TT 3M	Telescope voltage tester with magnet and 3 m connection line for one-sided earth connection 50...3000 V AC / DC test height variable up to 6,2 m 1690 x 120 x 110 mm; 2,800 kg		■	magnet	■	■	■	■
	89337	TT 3K	Telescope voltage tester with clamp and 3 m connection line for one-sided earth connection 50...3000 V AC / DC test height variable up to 6,2 m 1690 x 120 x 110 mm; 3,100 kg		■	clamp f. railfoot	■	■	■	■
	89347	TT 3UK	Telescope voltage tester with universalclamp und 3 m Leitung für einseitigen Erdanschluss 50...3000 V AC / DC test height variable up to 6,2 m 1690 x 120 x 110 mm; 3,510 kg		■	universal clamp	■	■	■	■
MultiSafe TT 36	89329	TT 36M	Telescope voltage tester with magnet and 3 m connection line for one-sided earth connection 50...36 000 V AC / DC test height variable up to 6,2 m 1740 x 120 x 110 mm; 2,970 kg		■	magnet	■	■	■	■
	89309	TT 36K	Telescope voltage tester with clamp and 3 m connection line for one-sided earth connection 50...36 000 V AC / DC test height variable up to 6,2 m 1740 x 120 x 110 mm; 3,270 kg		■	clamp f. railfoot	■	■	■	■
	89351	TT 36UK	Telescope voltage tester with universal clamp 3 m connection line for one-sided earth connec. 50...36 000 V AC / DC test height variable up to 6,2 m 1740 x 120 x 110 mm; 3,680 kg		■	universal clamp	■	■	■	■
	89348	TT 36UK-40L	Telescope voltage tester with universal clamp and 6 m-40kV connection line for earth connec. 50...36 000 V AC / DC test height variable up to 6,2 m 1740 x 120 x 110 mm; 4,310 kg		■	universal clamp	■	■	■	■
MultiSafe TT 36-8m	89310	TT 36K-8m	Telescope voltage tester with clamp and 3 m connection line for one-sided earth connection 50...36 000 V AC / DC test height variable up to 8,2 m 1740 x 120 x 110 mm; 4,170 kg		■	clamp f. railfoot	■	■	■	■
	89349	TT36UK-8m-40L	Telescope voltage tester with universal clamp and 6 m-40kV connection line for earth connec. 50...36 000 V AC / DC test height variable up to 8,2 m 1740 x 120 x 110 mm; 5,210 kg		■	universal clamp	■	■	■	■







Accessories high voltage and telescope voltage tester

	Art. No.	Type	Description		HS 5 / HS 5M / HS 5UK	HS 11 / HS 11M / HS 11UK	HS 36	TT 1	TT 3	TT 36
Electrodes	89312	ELEK-iHS15	Electrode i for HS 5 / HS 11 / HS 36 for testing busbars, uncoated length = 15 mm 160 x 100 x 5 mm; 0,005 kg		■	■	■			
	89316	ELEK-YHS15	Electrode Y for HS 5 / HS 11 / HS 36 for testing overhead lines, uncoated length = 15 mm 160 x 100 x 5 mm; 0,005 kg		■	■	■			
	89314	ELEK-GHS15	Electrode G for HS 5 / HS 11 / HS 36 for testing busbars, uncoated length = 15 mm 160 x 100 x 5 mm; 0,005 kg		■	■	■			
	89327	ELEK-S90-HS	Electrode for DSP HS 5 / HS 11 for tests at test holes, insertion depth = 90 mm at d = 8 mm 165 x 25 x 25 mm; 0,040 kg		■	■				
	89317	ELEK-XHB-2	Special-electrode for HS 5 / HS 11 for tests on 4 mm sockets flexible plug 160 x 25 x 25 mm; 0,040 kg		■	■				
	63051	ELEK-TTS	Leaf spring electrode short for TT 1 / TT 3 for tests on overhead lines or turned for tests on busbars 160 x 100 x 20 mm; 0,015 kg					■	■	
	63052	ELEK-TTL	Leaf spring electrode long for TT 1 / TT 3 / TT 36 for tests on overhead lines or turned for tests on busbars 250 x 150 x 20 mm; 0,035 kg					■	■	■
	89325	ELEK-Y-L	v-shaped electrode for TT 1 / TT 3 / TT 36 for tests on overhead lines and busbars 160 x 100 x 25 mm; 0,065 kg					■	■	■
Spare parts	63031	TT-PUFFER	Rubber bumper 30 x 25 mm with M8 thread for TT 1 / TT 3 / TT 36, top and bottom 160 x 100 x 30 mm; 0,030 kg				■	■	■	










Accessories high voltage and telescope voltage tester

	Art. No.	Type	Description		HS 5 / HS 5M / HS 5UK	HS 11 / HS 11M / HS 11UK	HS 36	TT 1	TT 3	TT 36
Bags and cases	84333	HS5-KLT	Artificial leather bag for HS 5 with shoulder strap 660 x 210 x 20 mm; 0,230 kg		■					
	84022	HS5-KOF	Solid box for HS 5 635 x 330 x 140 mm; 3,000 kg		■					
	84331	HS-KLT	Artificial leather bag for HS 11 with shoulder strap 120 x 290 x 20 mm; 0,560 kg			■				
	84330	HS11-KOF	Solid box for HS 11 1250 x 325 x 140 mm; 6,200 kg			■				
	84334	HS36-KOF	Hard-top case for HS 36 with trolley wheels, waterproof 1200 x 440 x 160 mm; 10,860 kg				■			
	63041	HS36-WAND	Wall holder for HS 36 for fixed mounting including spacers 170 x 100 x 20 mm; 0,100 kg				■			
	63042	TT-WAND	Wall holder for TT 1 / TT 3 / TT 36 for fixed mounting 160 x 100 x 30 mm; 0,045 kg					■	■	■
	84332	TT-KLT	Artificial leather bag for TT 1 / TT 3 / TT 36 with shoulder strap 1780 x 245 x 20 mm; 0,700 kg					■	■	■
	84336	TT-KOF	Solid box for TT 1 / TT 3 / TT 36 1800 x 270 x 150 mm; 7,200 kg					■	■	■
Connection cable	89392	TT-LEI-MAG	Connection cable with magnet 1,8 m / 6 kV insulated for TT1 / TT3 / TT36 / HS36 to use on overhead lines up to 36 kV or for in switchgears up to 6 kV 250 x 150 x 40 mm; 0,240 kg				■	■	■	■
	89393	TT-LEI-K	Connection cable with clamp for railfoot 1,8 m / 6 kV insulated for TT1 / TT3 / TT36 / HS36 to use on overhead lines up to 36 kV or for in switchgears up to 6 kV 330 x 150 x 40 mm; 0,510 kg				■	■	■	■
	89394	TT-LEI-UK	Connection cable with universalclamp 1,8 m / 6 kV insulated for TT1 / TT3 / TT36 / HS36 to use on overhead lines up to 36 kV or for in switchgears up to 6 kV 220 x 150 x 40 mm; 0,920 kg				■	■	■	■
	89395	TT-LEI-UK-40L	Connection cable with universalclamp 6 m / 40 kV insulated for TT1 / TT3 / TT36 / HS36 to use on overhead lines up to 36 kV or for in switchgears up to 36 kV 300 x 300 x 50 mm; 1,550 kg				■	■	■	■











Ex-measuring and testing devices

	Art. No.	Type	Description		Low resistance resistance measurement	High resistance resistance measurement	Normal resistance measurement	Frequency measurement	Suitable for Ex-areas	Voltage measurement
Earth resistance tester EP 4	83302	EP 4	Earth resistance tester / Low-impedance tester in accordance with EN 61557-4 measuring range 0,01 Ω ... 1999 k Ω including test line 300 x 100 x 50 mm; 0,350 kg		■					
	83301	EP 4Ex	Earth resistance tester / Low-impedance tester in accordance with EN 61557-4 measuring range 0,01 Ω ... 1999 k Ω including test line Ex-proofed typed 300 x 100 x 50 mm; 0,370 kg		■				■	
Insulation tester ISO 1	83315	ISO 1	Insulation tester / High-impedance tester in accordance with EN 61557-2 measuring range 1 k Ω ... 20 G Ω including one test lines and one crocodile clips 300 x 100 x 50 mm; 0,400 kg			■				
	83310	ISO 1Ex	Insulation tester / High-impedance tester in accordance with EN 61557-2 measuring range 1 k Ω ... 2 T Ω including two test lines and two crocodile clips Ex-proofed typed 300 x 100 x 50 mm; 0,450 kg			■			■	
Ex-Multimeter	82025	EXM 25A	Ex-Multimeter with NiMH accu / T4 including test line, without plug-in power supply NG4 Ex-proofed typed 220 x 210 x 75 mm; 0,645 kg				■	■	■	■
	82026	EXM 25LB	Ex-Multimeter with Lithium battery / T6 including test line, without plug-in power supply NG4 Ex-proofed typed 220 x 210 x 75 mm; 0,630 kg				■	■	■	■


Accessories for Ex-measuring and testing devices

Test lines	Art. No.	Type	Description		EP 4	EP 4Ex	ISO 1	ISO 1Ex	Suitable for Ex-areas	EXM 25
	73009	EP-LEI	Test line with 4 mm plug, CAT II, with protective cap CAT III 1000 V, black 170 x 100 x 30 mm; 0,045 kg		■	■	■	■	■	■
	82010	WID	Test line with 4 mm plug CAT II 1000 V in pairs red / black 170 x 100 x 30 mm; 0,090 kg		■	■	■	■	■	■
	84311	L-SETR	Test line with two 4 mm plugs, red including crocodile clip CAT IV 600 V / CAT III 1000 V 170 x 100 x 30 mm; 0,060 kg		■	■	■	■	■	■
	84314	L-SETS	Test line with two 4 mm plugs, black including crocodile clip CAT IV 600 V / CAT III 1000 V 170 x 100 x 30 mm; 0,060 kg		■	■	■	■	■	■
	73010	ISO-TOL	Test line with two 4 mm plugs, black for teraohm-measuring for high bleeder resistors CAT IV 600 V / CAT III 1000 V 170 x 100 x 15 mm; 0,030 kg				■	■	■	
	73006	EP-DH50	Wire reel with 50 m measuring line with two 4 mm plugs 300 x 150 x 50 mm; 0,670 kg		■	■	■	■	■	■
	73004	EP-RH50	Decoiler with 50 m measuring line and 4 mm plug and 4 mm socket not suitable for Ex-areas! (only decoiled measuring line in Ex-areas) 200 x 180 x 80 mm; 0,750 kg		■	■	■	■	■	■
	72010	SPA	Voltage test prods for EXM 24 / 25 for tests in Ex-areas up to 1000 V CAT IV 1000 V 170 x 90 x 50 mm; 0,105 kg						■	■
	72011	SPA-HS2	Voltage test prods for EXM 25 for tests in Ex-areas up to 2000 V 220 x 90 x 50 mm; 0,150 kg						■	■

Accessories for Ex-measuring and testing devices

Accessories	Art. No.	Type	Description		EP 4	EP 4Ex	ISO	ISO 1Ex	Suitable for Ex-areas	EXM 25
	73001	EP-EK	Earth clamp with 4 mm socket 160 x 150 x 30 mm; 0,065 kg		■	■			■	
	73007	EP-SAW	Sawtooth test prod for EP 4, attachable 100 x 170 x 20 mm; 0,040 kg		■	■				
	62015	BAT-AIMn	Battery MN 1604 Plus Power Duralock, Al-Mn-block 9 V black/gold approved for EP 4Ex / ISO 1Ex / MZ 1005 120 x 85 x 20 mm; 0,050 kg		■	■	■	■	■	
	72025	EXM-AK9	EXM accu NiMH, T4 9 V, 170 mAh / 40 h operation 75 x 25 x 35 mm; 0,070 kg						■	■
	72026	EXM-LB3	EXM Lithium battery T6 3,6 V, 2400 mAh / 300 h operation 75 x 25 x 35 mm; 0,055 kg						■	■
	72328	NG4	Plug-in power supply NG4 for charging the EXM accu NiMH 100 x 80 x 60 mm; 0,280 kg							■
	82319	MZ 1005	Clamp-on ammeter, for EXM 25 1000 A AC / DC, including battery 220 x 110 x 70 mm; 1,000 kg						■	■
	82318	TMZ 25	Temperature measurement accessory for EXM 25 -80 ° ... + 600 °C without sensor 280 x 180 x 50 mm; 0,100 kg						■	■
	82107	EXM-TFU	Universal sensor, 250 mm for TMZ 25 600 x 30 x 30 mm; 0,020 kg						■	■
82108	EXM-TFO	Surface sensor, 110 mm for TMZ 25 600 x 30 x 30 mm; 0,020 kg						■	■	

Accessories for Ex-measuring and testing devices

	Bags and cases				EP 4	EP 4Ex	ISO 1	ISO 1Ex	Suitable for Ex-areas	EXM 25
	Art. No.	Type	Description							
Bags and cases	81032	SP-KLT	Artificial leather bag for EP 4 with hand strap not suitable for Ex-areas! 300 x 130 x 60 mm; 0,475 kg		■	■	■	■		
	81030	SP-LED	Leather bag for EP 4 / EP 4Ex / ISO 1Ex with hand strap and shoulder strap 300 x 130 x 60 mm; 0,475 kg		■	■	■	■	■	
	73021	EP-LED	Leather case for EP 4 / EP 4Ex / ISO 1Ex and accessories 370 x 240 x 120 mm; 1,480 kg		■	■	■	■	■	
	82011	EXM-LED	Leather ever-ready bag for EXM with shoulder strap, The tester can remain in the bag during measurement 200 x 180 x 50 mm; 0,370 kg					■	■	■
ISO-electrodes	73008	ISO-PROBE	Attachable test probe for ISO 1Ex, CAT III not suitable for Ex-areas! 150 x 100 x 20 mm; 0,015 kg				■	■		
	73011	ISO-ELR	Annular electrode for surface resistance and volume resistivity, delivery in solid box with calibration plate in accordance with EN 61340-5-1 / 61340-2-3 350 x 315 x 65 mm; 2,300 kg				■	■	■	
	73012	ISO-ELV0	Electrode for surface resistance and volume resistivity, in accordance with EN 61340-4-1 / 61340-2-3 180 x 80 x 80 mm; 2,32 kg				■	■	■	
	73013	ISO-3FUSS	Tripod electrode for floors and surfaces in accordance with EN 1081 240 x 230 x 45 mm; 0,605 kg				■	■	■	

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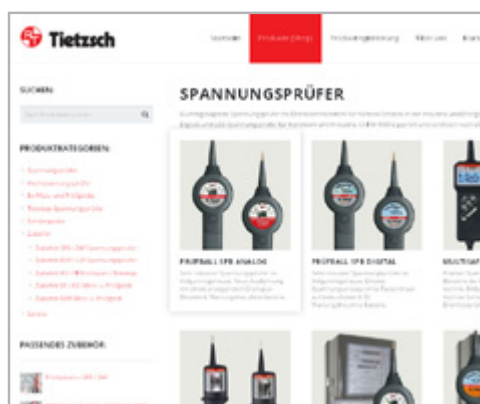


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